M7220
Wireless Handheld Terminal

User's Guide

Effective date: September 2010

Introduction

Introducing the M7220

The M7220 hand-held terminal is an ultra-versatile, high-performance, designed-to-fit-your-budget terminal. The ergonomic design easily fits in even the smallest of hands. It is rugged, lightweight, compact and easy-to-use. The high resolution graphical display is capable of presenting a multitude of fonts and images.

The M7220 utilizes a true, fully functional, Linux® operating system. The Linux operating system is well known for its stability, speed and conservative memory usage. The Linux operating system coupled with the M7220's high speed processor makes the M7220 one of the fastest handheld terminals on the market today. In test after test the Linux operating system has out-performed DOS and Windows operating systems when compared on similar hardware platforms.

The power saving features of the M7220 include auto-off and power save modes, which reduce power consumption until an operator provides input. These features conserve battery power and lengthen the time between charges or battery replacement. The M7220 will operate for a full 8 hour shift without requiring the battery to be re-charged or replaced.

Warranty

A one-year warranty against material defects and workmanship from the date of shipment is guaranteed by American Microsystems, Ltd. Products are sold on the basis of specifications applicable at the time of manufacture. American Microsystems, Ltd. shall have no obligation to modify or update products once sold. At our option, we will repair or replace, at no charge, any unit that proves to be defective providing the appropriate steps are taken to procure an RMA (Return Materials Authorization) number and shipping instructions from American Microsystems, Ltd.

General Conventions

Before you begin to use the M7220 wireless hand-held terminal, it is important that you understand key conventions and terms used in this manual.

Keys	Description
[KEY]	The square brackets indicate a specific key on the M7220 handheld terminal's key pad.
Bold	Words you type – for example when you are instructed to type **A:\setup**. Bold also refers to existing filenames.
Italic	**Notes
Italic/Bold	***Warning!*** And section references.
Select	After selecting a procedure or menu, "Select" means that after you select the menu item or action, you should press ENTER.

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Chapter 1

M7220 Terminal Overview

Technical Specifications

General Specifications	
Dimensions	8.9" L x 3.5" H x 2.3" D (225 L x 89 H x 57 D mm) without optional handle 8.9" L x 3.5" H x 8.2" D (225 L x 89 H x 208 D mm) with optional handle)
Weight	16 oz (454 g) without optional handle 25 oz (709 g) with optional handle
Display	160 x 160 pixel Grayscale LCD with EL backlight
Keyboard Options	35-key Numeric Keypad 55-key Alpha-Numeric Keyboard
Data Capture & Bar Code Scanner Options	Standard High-Speed Laser with aiming capability Long Range Laser with aiming capability Advanced Long Range Laser with aiming capability 2-Dimensional Area Imager
Battery	Lithium-Ion 2600 mAh, 19.2 Watt-hour
I/O Ports	USB Type B (Slave) Serial RS-232 (max. rate 115200 baud)
Sound	Integrated system bell (beeper)
Operating Temperature	14° to 122° F (-10° to 50° C)
Storage Temperature	-13° to 122° F (-25° to 50° C)
Humidity	90% humidity, non-condensing
Static Discharge	15 kVdc through air / 4kVdc contact, all sides
Drop Rating	5 ft. (1.5m) drop to concrete
Regulatory	FCC Part 15 Class A RoHS Compliant / Pb-Free Laser (if equipped): CDRH Class II, IEC Class 2

Architecture Specifications	
Processor	Samsung S3C2410 32-bit ARM9 @ 202 MHz with Advanced Microcontroller Bus Architecture (AMBA)
Memory	32 MiB SDRAM @ 101MHz, 16 MiB Non-volatile NOR Flash
Operating System	AML Embedded Linux OS, Linux Kernel 2.6.16
Development Environment	AML M7220 SDK for Linux supporting C and C++ GNU GCC 3.3.5 for ARM-Linux Fully Open-Sourced Licensing

Included Software	
Terminal Emulation	VT100/102 VT220 TN5250 SSH
Web Browser	'Links2' graphical and text based web browser
Utilities	Calculator Bar Code Data Viewer Linux Console Camera Utility (If equipped with optional 2-Dimensional Imager)
Servers	TELNET FTP SSH/SFTP HTTP
Diagnostic Tools	Printer Test Network Status Application System Resource Usage Network Ping Utility

Wireless Radio Specifications	
Radio Type	IEEE 802.11b/g
Frequency (GHz)	North America: 2.412 – 2.462 GHz Japan TELEC: 2.412 – 2.484 802.11b Japan TELEC: 2.412 – 2.472 802.11g Europe ETSI: 2.412 – 2.472 Spain: 2.457 – 2.462
Bitrates (Mbps)	802.11b: 11, 5.5, 2, 1 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 with auto-fallback
Transmit Power (dBm)	802.11b: 17 dBm (40 mW) 802.11b/g: 14 dBm (32 mW)
Receiver Sensitivity (dBm)	54/48 Mbps: -65 dBm / -66 dBm 24/36 Mbps: -70 dBm / -74 dBm 12/18 Mbps: -77 dBm / -79 dBm 11 Mbps: -80 dBm (802.11b) 6/9 Mbps: -81 dBm / -82 dBm
Modulation	48/54 Mbps (QAM-64) 24/36 Mbps (QAM-16) 12/18 Mbps (QPSK) 6/9 Mbps (BPSK)
Antenna	Internal Diversity
Security	None 64 (40)-bit WEP 128 (104)-bit WEP WPA/WPA2 Personal (PSK) WPA/WPA2 Enterprise (EAP802.1x Supplicants)

This product is covered under U.S. Patent Nos. 5,400,338 and 6,480,497

System Features

Processor and Memory

The M7220 is based on the Samsung S3C2410 System-on-a-chip (SoC) with Advanced Microcontroller Bus Architecture (AMBA) clocked at 202 MHz. In standard benchmark tests, the M7220's processor has out preformed Intel X-Scale processors clocked at twice the speed of the S3C2410. Coupled with a 100 MHz system bus and 32 MiB of 100 MHz SDRAM, the Samsung processor makes the M7220 hand-held computer one of the most powerful devices available. Furthermore, the M7220 comes complete with 16 MiB of industry standard NOR flash for storing the operating system, user settings, and third party applications.

Operating System

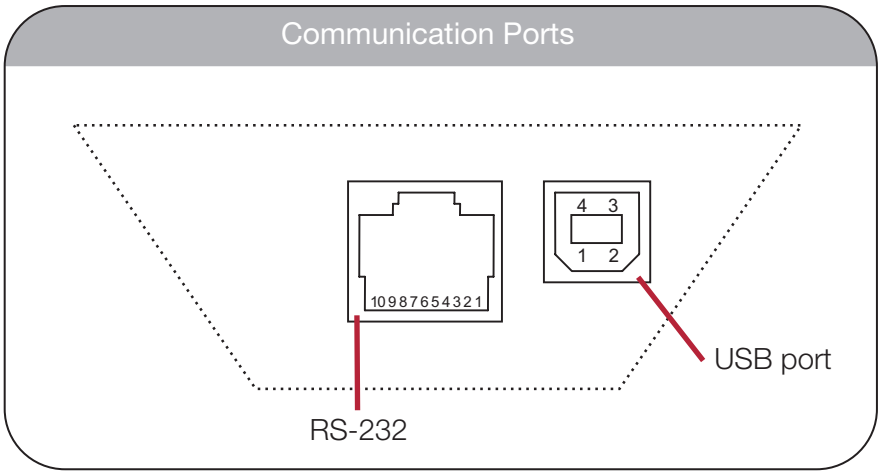
The M7220 runs a complete Linux based operating system along with other Open Sourced tools. The benefits of Linux are in its speed, reliability, and freely available source code. Nearly all applications and the entire operating system software and source code is available free of charge and licensed under open source licenses include the General Purpose License and Lesser General Purpose License.

Included Software

The M7220 hand-held computer comes complete with all of the most common terminal emulation capabilities including VT100/102, VT220, and TN5250. Furthermore, the M7220 comes standard with the Links2 web browser for Web and Internet based applications along with many other integrated tools, utilities, and diagnostics.

Communication Ports

The M7220 has two types of communication ports on the bottom of the unit. The ports are shown here.



Description of the RJ-45 10 Pin Connector (RS-232)

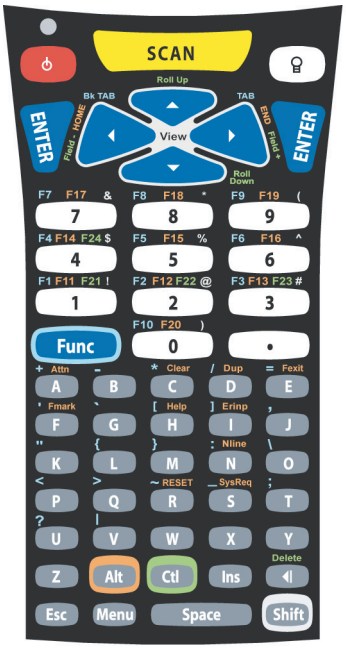
1. USB Ground
2. RxD (in to terminal)
3. TxD (out from terminal)
4. RTS (out from terminal)
5. GND
6. In Cradle Sensor
7. CTS (in to terminal)
8. UDC+ (USB data +)
9. UDC – (USB data -)
10. Battery

WARNING: Using an 8 Pin RJ-45 connector can cause damage to the devices's 10 Pin RJ-45 interface connection.

M7220 Keyboard

The M7220 has two keyboard options:

- 55-key Alphanumeric Keyboard
- 35-key Numeric Keyboard

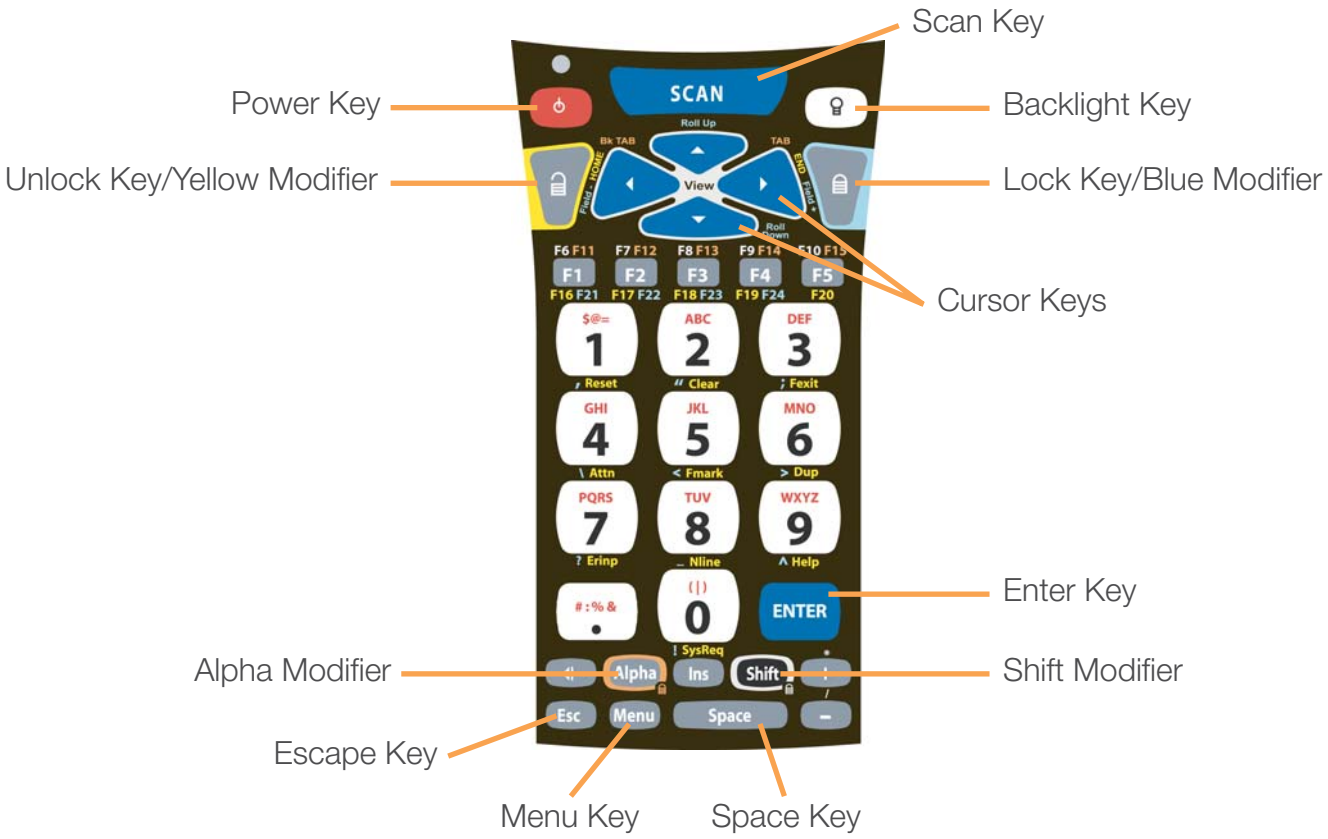


Alphanumeric

Numeric

The high contrast, color coded overlay surrounding the keyboard keys indicates alternate functions of each key. Pressing a modifier key (Shift, Alt, Ctl, Lock, Unlock, Func) will enable that modification for the next key press only.

Using the 35-key Keypad



Key	Function
Power Button	Turn on/off the M7220 unit or wake the M7220 from Suspend Mode
SCAN Key	Enable the bar code scanner or wake the M7220 from Suspend Mode
Unlock Key	Enable the Blue Modifier
Lock Key	Enable the Yellow Modifier
ENTER	Select an option or send a standard Enter key
Space	Send a standard space or move the cursor to the right one position
<|	Send a standard backspace or move the cursor to the left one position
Esc	Send a standard Escape or Exit the current menu
"Light Bulb"	Enable/Disable the LCD Backlight
Ins	If the current application supports it, toggle between Insert mode and Replace mode
Menu	Return to the Main Menu or cycle through available menus
Alpha Key	Enable the Alpha modifier to type alphabetic data
Shift	Enable the Shift modifier for the next key press

Using the 35-key Keypad - cont'd.

Using the Alpha key on the 35-key Keypad

If the M7220 hand-held computer is equipped with the numeric keypad, the unit will allow alphabetic input in a mobile phone style interface.

Pressing the Alpha key once, will put the keyboard into Alpha Mode. Within Alpha Mode, a numeric key (0 – 9 or period) can be pressed and released multiple times to allow input of any of the three or four red symbols on the key. After no other key has been pressed for 200 milliseconds, the input will be processed.

For example, to type the letter 'b', the user would press the [Alpha] key ONCE, followed by the [2] key TWICE. If the user does not press any other key for 200 milliseconds, the input will be processed as a lower case letter 'b'. If the user had pressed any key other than the [2] key within the 200 milliseconds timeout, the system would have processed the 'b' and followed it with the next key. If the user had pressed the [2] key a third time within the timeout period, the input would have been processed as a lower case letter 'c'.

To input a capital letter, the user must press the [Shift] key before the [Alpha] key, or directly after the press of the [Alpha] key.

For example, to type the capital letter 'B', the user could press the [Shift] key ONCE, followed by the [Alpha] key ONCE, followed by the [2] key TWICE, or, alternatively they could press the [Alpha] key ONCE, followed by the [Shift] key ONCE, followed by the [2] key TWICE. The system will respond to either input with a capital letter 'B'.

Using the 35-key Keypad - cont'd.

Using Lock and Unlock on the 35-key Keypad

If the user needs to input a large amount of alphabetic data, they can temporarily enable the Alpha-Lock feature by pressing the Lock/Blue Modifier followed by the [Alpha] key. To disable Alpha-Lock, the user can press the Unlock/Yellow Modifier followed by the [Alpha] key.

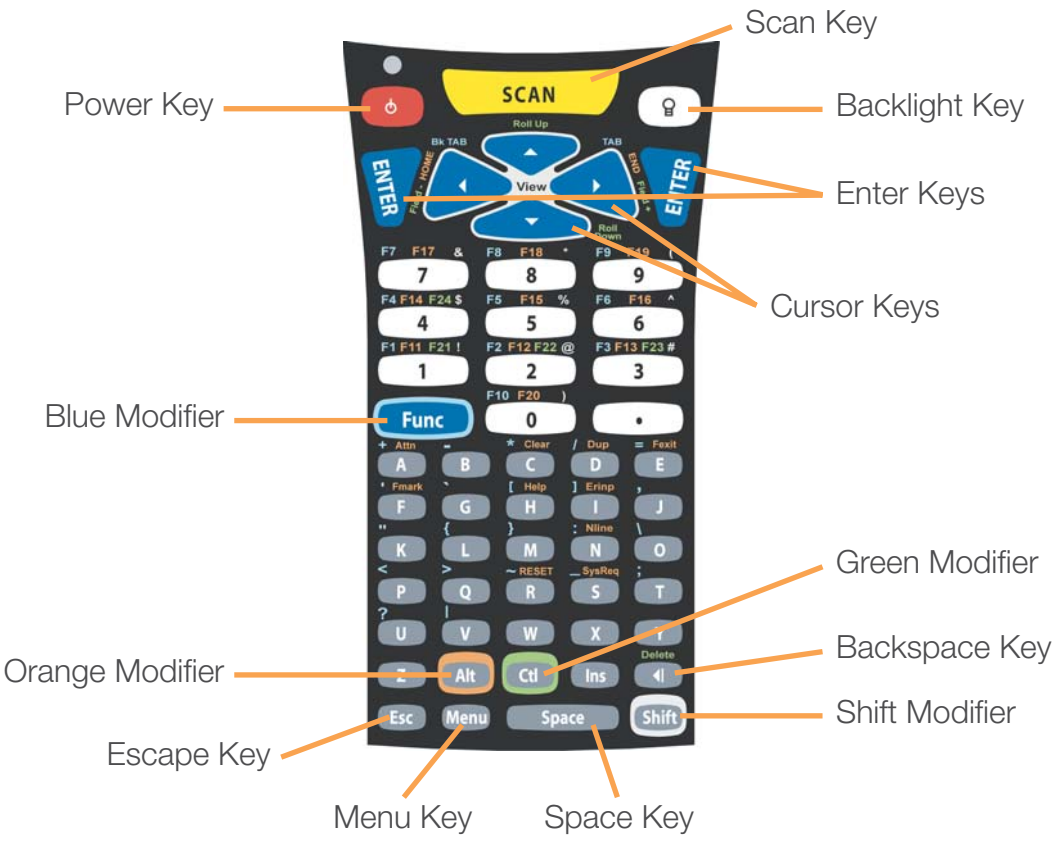
The [Shift] key can be locked and unlocked in the same manner to create a CAPS lock.

Locking the Keypad

The M7220 35-key numeric keypad can also be completely disabled to prevent unwanted key presses. This is useful if the user is transporting the M7220 hand-held computer in a holster but does not wish to power off the device.

To lock the M7220 35-key Keypad, press the Lock/Blue Modifier followed by the [Esc] key. The unit will disregard any further key presses and display a warning to the user. To re-enable the keypad, press the Unlock/Yellow Modifier followed by the [Esc] key.

Using the 55-key Keypad



Key	Function
Power Button	Turn on/off the M7220 unit or wake the M7220 from Suspend Mode
SCAN Key	Enable the bar code scanner or wake the M7220 from Suspend Mode
ENTER	Select an option or send a standard Enter key
Space	Send a standard space or move the cursor to the right one position
<|	Send a standard backspace or move the cursor to the left one position
Esc	Send a standard Escape or Exit the current menu
"Light Bulb"	Enable/Disable the LCD Backlight
Ins	If the current application supports it, toggle between Insert mode and Replace mode
Menu	Return to the Main Menu or cycle through available menus
Shift	Enable the Shift modifier for the next key press
Alt	Enable the Orange Modifier
Ctl	Enable the Green Modifier

Data Capture and Bar Code Scanners

The M7220 hand-held computer comes standard with a laser scan engine that is capable of scanning single dimensional bar codes. Optionally, Long Range Lasers and 2-Dimensional Area Imagers can be ordered for the M7220.

Bar code symbologies are always measured in mils. This usually refers to the narrowest bar width. One mil equals 0.001", therefore a 0.01" wide narrow bar would be a 10 mil bar code.

Conversion: 1 mil = 0.0254 mm
1 inch = 25.4 mm

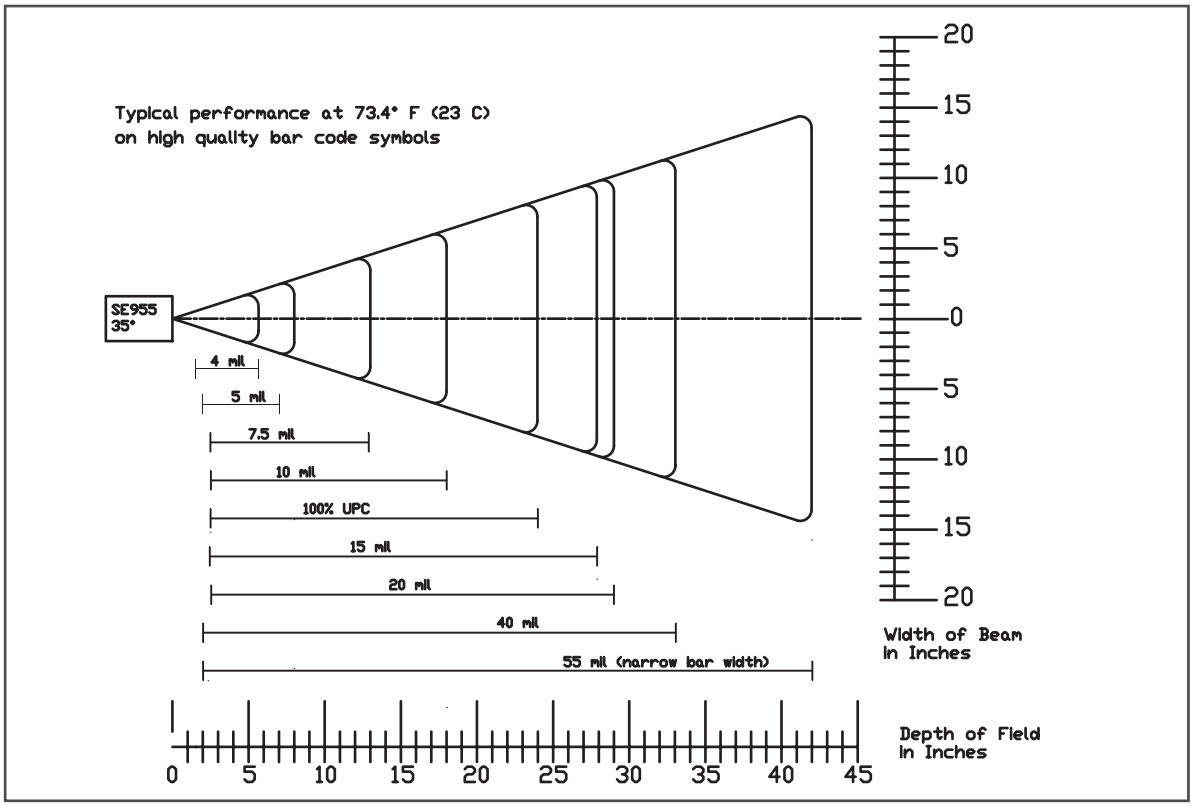
Laser Style Scan Engines

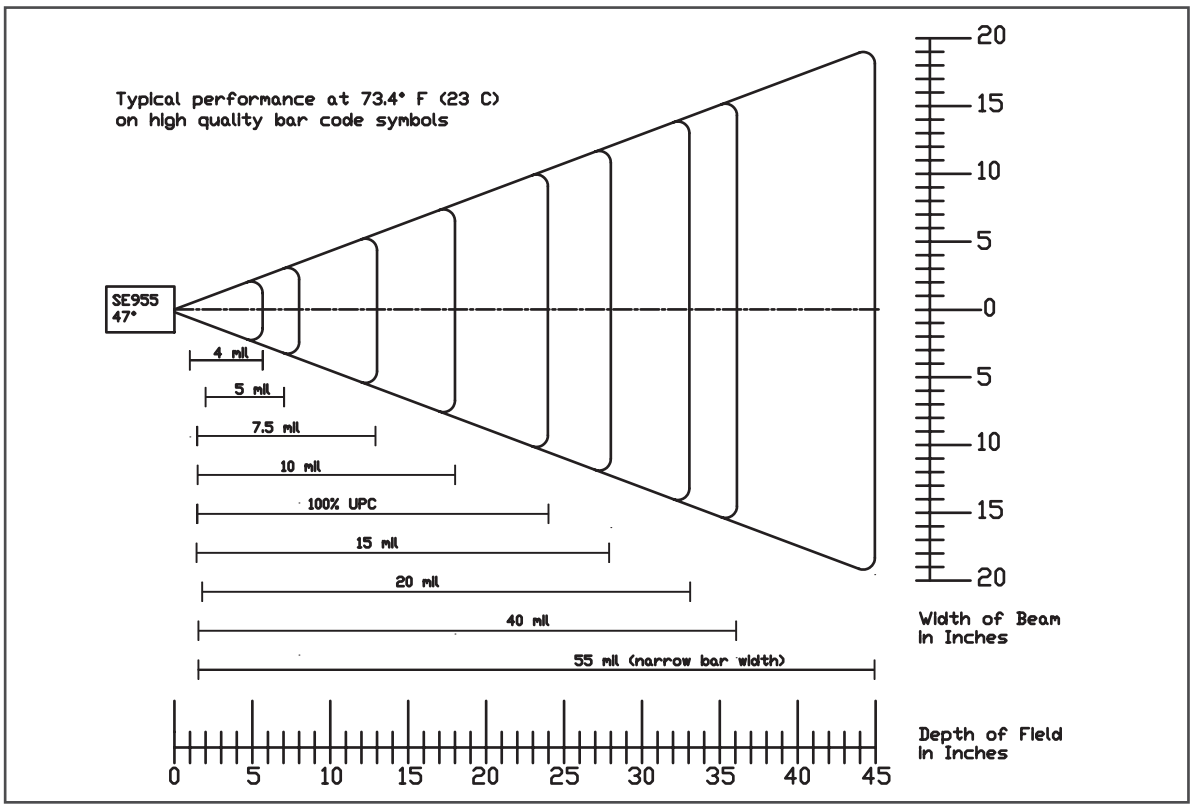
Laser-type scan engines use a stationary laser reflected by a moving mirror and a highly sensitive laser detector. The Long Range and Advanced Long Range scan engines allow for a much greater distance between the symbol and operator. All laser scan engines have the ability to produce a aiming dot to assist the operator in correctly reading symbols at longer distances.

Laser Decoder Symbologies	
UPC w/ supplements	Code 11
EAN/JAN	Interleaved 2 of 5
Code 128	Discrete 2 of 5
EAN 128	Chinese 2 of 5
ISBT 128	Codabar
Code 39	MSI / Plessy
Code 93	GS1 (RSS) Databar
GS1 (RSS) Limited	GS1 (RSS) Expanded

Laser Engine	Scan Rate	Scan Angle	Min. Print Contrast (%) Dark Light Reflectance @ 650 nm
Standard High Speed Laser	116 ±5 scans / second	47° ±2.5° or 35° ±2.5° Software Controlled	20%
Long Range Laser	35 ±5 scans / second	23° ±2°	40%
Advanced Long Range Laser	35 ±5 scans / second	13° ±2°	40%

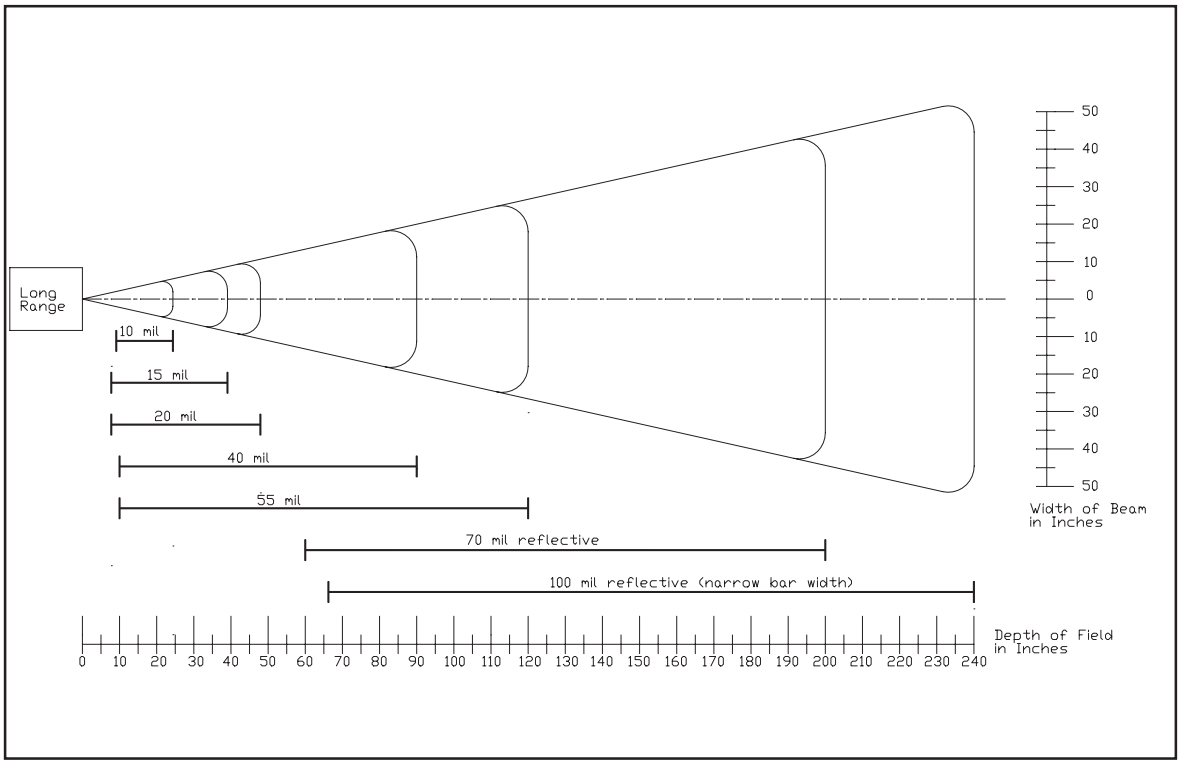
Data Capture and Bar Code Scanners - cont'd.



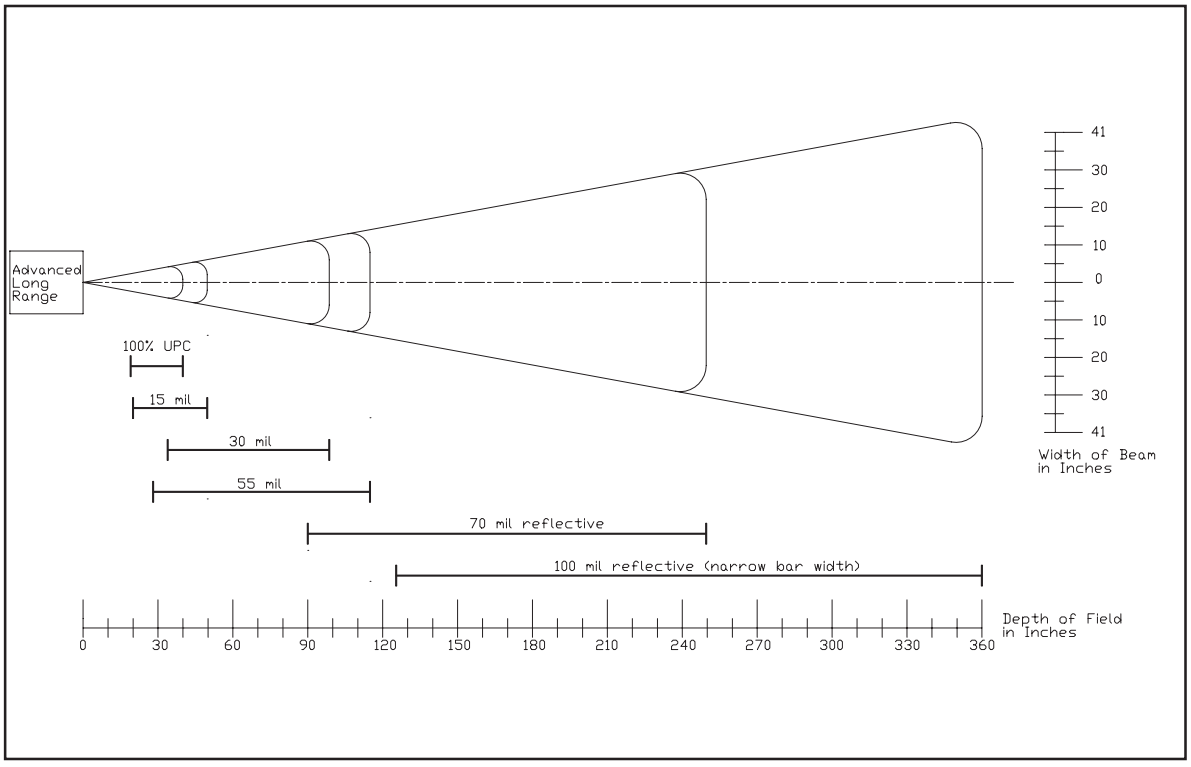


Reading distance for the Standard High Speed Laser

Data Capture and Bar Code Scanners - cont'd.


Long Range
10 mil
15 mil
20 mil
40 mil
55 mil
70 mil reflective
100 mil reflective (narrow bar width)
50 40 30 20 10 0 10 20 30 40 50
Width of Beam in Inches
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240
Depth of Field in Inches

Reading distance for the Long Range Laser


Advanced Long Range
100% UPC
15 mil
30 mil
55 mil
70 mil reflective
100 mil reflective (narrow bar width)
41 30 20 10 0 10 20 30 41
Width of Beam in Inches
0 30 60 90 120 150 180 210 240 270 300 330 360
Depth of Field in Inches

Reading distance for the Advanced Long Range Laser

Data Capture and Bar Code Scanners - cont'd.

Imager Style Scan Engines

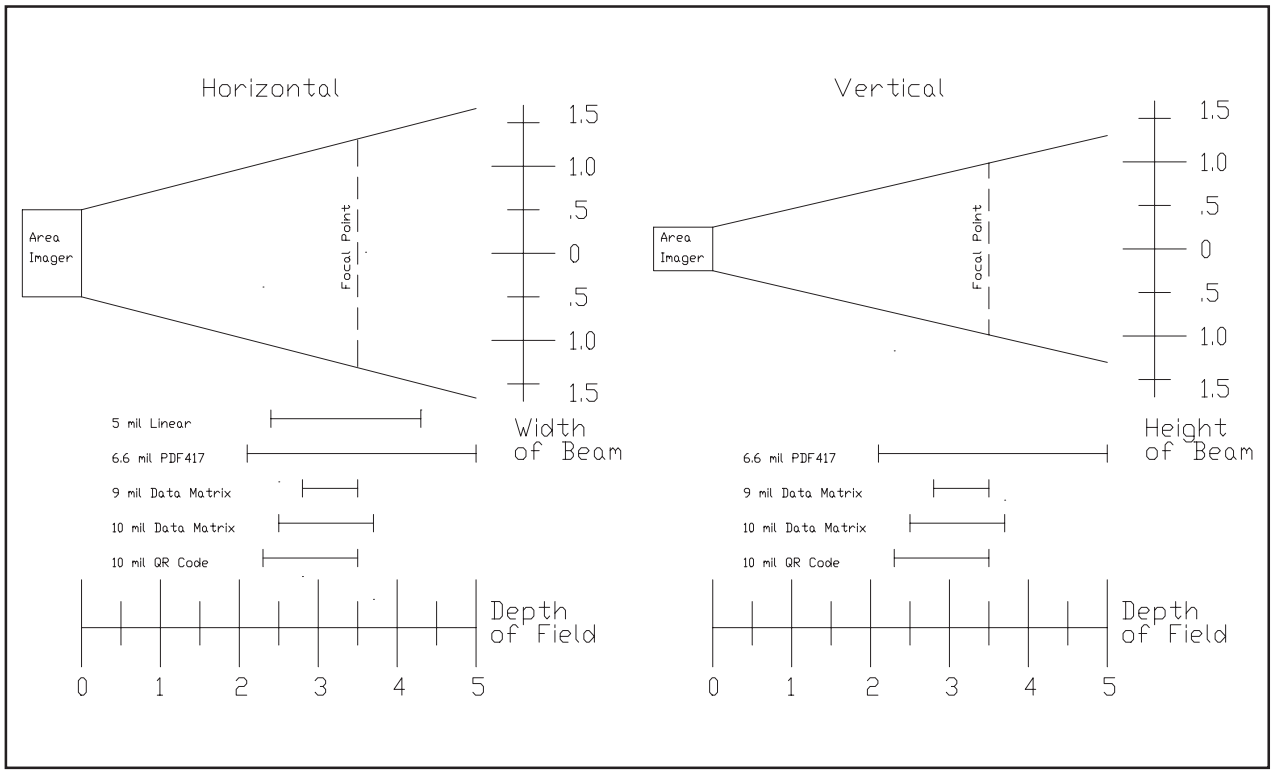
The Area Imager uses a camera type sensor to acquire images of the target symbol. Unlike the linear laser engines, the Area Imager can decode symbols at any orientation and is capable of reading 2-Dimensional symbologies.

Area Imager Symbologies			
UPC w/ supplements	Code 11	Codablock F	QR Code
EAN/JAN	Interleaved 2 of 5	Code 16K	TCIF Linked Code 39
Code 128	Discrete 2 of 5	Data Matrix	Telepen
EAN 128	Industrial 2 of 5	EAN-UCC Composite	PosiCode A
ISBT 128	Codabar	Matrix 2 of 5	PosiCode B
Code 39	MSI / Plessy	MaxiCode	MicroPDF417
Code 93	GS1 (RSS) Databar	Aztec	PDF417
GS1 (RSS) Limited	GS1 (RSS) Expanded		

Area Imager Postal Codes			
Planet Code	Postnet	British Post	Canadian Post
Chinese Post	Japanese Post	Kix (Netherlands) Post	Korean Post

Area Imager OCR Fonts			
OCR-A	OCR-B	SEMI	U.S. Currency
MICR E-13B			

Data Capture and Bar Code Scanners - cont'd.



The M7220 Scanner LED

The M7220 has a multi-color LED to indicate when the unit has scanned a bar code successfully. When the scan button is pushed, the LED above the on/off button will turn a solid red. Once the scanner has successfully read the bar code, this LED will turn a bright green.

This visual indication of a good read is useful in very noisy environments where the audio beeper can not be heard.

Note: When the M7220 is in sleep mode the scanner LED will be flashing green.

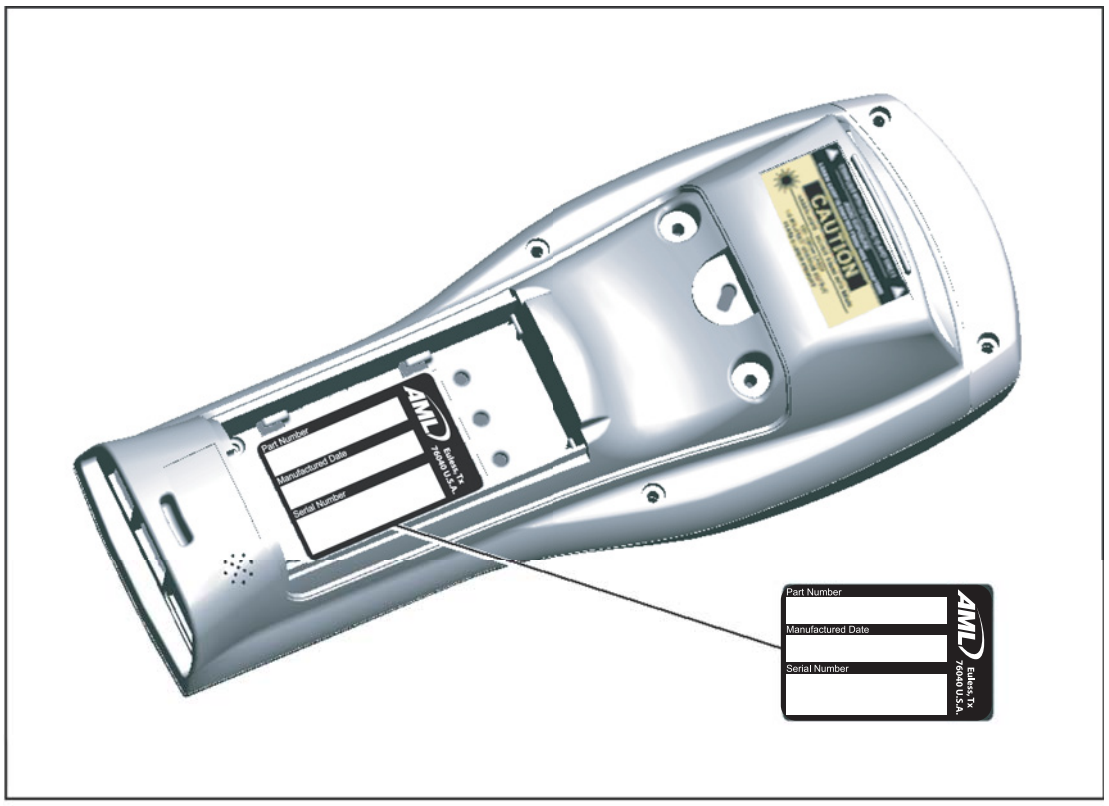
Scanner Information and Labeling

The M7220 Integrated Laser Scanner uses a low-power visible laser diode. Avoid staring directly into the light beam. Momentary exposure to a CDRH Class II laser is not known to be harmful.

Laser Classification: CDRH Class II
Light Source: 630 – 680 nm laser diode
Laser Output Power: 1.0 milliwatt maximum output
FCC Information: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CE

CAUTION: Use of controls, adjustment, or performance of procedures other than those specified herein may result in hazardous visible laser light exposure.


CAUTION
Part Number
Manufactured Date
Serial Number
AML
Euless, Tx
76040 U.S.A.

The M7220 Internal Radio

The M7220 Hand-held Terminal comes equipped with an internal 802.11b/g radio and diversity antenna. This internal radio is specifically designed to communicate with any 802.11b/g Access Point. The range of the internal radio depends greatly on the quality of the Access Point and the RF communications characteristic of the environment where the device is used. The typical range for an 802.11b/g radio is 500 feet through free air. Additional Access Points must be added to improve coverage in a larger area, or in electrically noisy RF environments.

802.11b/g Fallback Mode

Wireless LAN technology is designed to make maintaining a connection between two devices as reliable and consistent as possible. Since the speed of the connection between wireless devices will vary as range and signal quality varies, the wireless devices will intentionally sacrifice throughput (data rate or connection speed as measured in bits per second) in exchange for maintaining a reliable connection. In other words, a reliable connection at a lower speed is preferred over an unreliable connection at a higher speed (i.e., it is easier to maintain the connection if data rate is deliberately reduced, or put another way, lower data rates will tolerate a higher range and/or worse signal quality). This characteristic is known as fallback. As example, an 802.11b/g system will fallback from 11 Mbps to 5.5 Mbps as range increases or signal quality decreases. Subsequent fallbacks from 5.5 Mbps to 2 Mbps and 1 Mbps are also supported.

Interference and Coexistence

802.11b/g operates in a range of radio frequencies known as an "unlicensed" band (i.e. the FCC does NOT require the use of a license in order to operate a radio transmitter in this range). This means that commercially available radio devices other than wireless LAN devices are permitted to use the same frequency band as 802.11b/g. Consequently, these co-existing radio devices can interfere or "jam" the wireless LAN (and vice versa). Ironically, the most troublesome devices are cordless telephones and microwave ovens.

Fortunately, higher quality cordless phones tend to "listen" for a clear channel before becoming active and will thus avoid interfering with a wireless LAN (i.e., the cordless phone seeks a clear channel for itself so naturally avoids being interfered with or being a source of interference). Jamming from microwave ovens is more severe but is usually restricted to the upper frequency range for 802.11b/g (it should be noted that 802.11b/g divides the available frequency band into 11 channels. The higher numbered channels are most susceptible to microwave oven interference).

In each instance, jamming occurs only when the cordless telephone or microwave oven is active.

Security Issues

Much has been publicized in the media about security problems with wireless LANs. It is highly recommended that WPA encryption be used and in some cases the access points should be set for MAC filtering. When an access point has MAC filtering enabled, the only devices that can communicate through them are the ones which the MAC address has been set.

The primary issue is that many current users of wireless LAN have opted NOT to turn on security features. If users were to enable the security features currently available (including only allowing known systems access to the network and enabling WEP (Wired Equivalent Privacy) or WPA (WiFi Protected Access) encryption the intruder's work is much harder. Much as a burglar will bypass a house whose doors and windows are securely locked, so too will a hacker tend to bypass a network where security measures are enabled.

Battery

The M7220 hand-held computer uses a single battery to supply power to the entire unit. The standard 7.2 Volt, 19.2 Watt-hour battery allows the unit to run continuously for over eight hours, even in the most demanding environments.

WARNING: Use only Lithium-Ion batteries provided by American Microsystems, Ltd. The use of other batteries can result in improper charging, short circuits, fire, and explosion. The use of improper batteries will void all warranties on the M7220 hand-held computer.

NOTE: Lithium-Ion batteries and battery packs provide 300-500 charge/discharge cycles, and although they are not susceptible to "battery memory" like older Nickel-Cadmium technologies, they do loose capacity as they age. When a battery is no longer able to supply ample charge for the application it should be recycled.

The M7220 battery can be charged either through an external battery charger or from within the hand-held computer when the unit is placed in the charging and communication cradle. Typical charging time will vary depending on the charging method and charger.

WARNING: M7220 Batteries should only be charged with American Microsystems, Ltd. battery chargers approved for M7220 batteries.

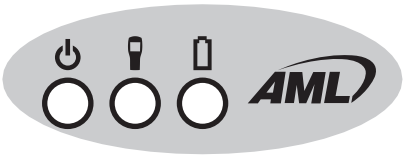
The M7220 hand-held computer will alert the user when the battery has reached a critical level. The unit's battery should be replaced with a fully charged M7220 battery or the unit should be placed back into the charging and communication cradle.

Accessories

The M7220 Hand-held Terminal has available an optional charging and communications cradle. The cradle automatically charges the M7220 battery while it is resting in the cradle and the unit is turned off. The cradle also includes an extra slot to charge a spare battery. The M7220 cradle can accommodate the M7220 with or without the optional M7220 handle.

M7220 and Cradle

The ACC-5925 Cradle has three indicator lights:



- Indicates that the M7220 Cradle is plugged in.
- Indicates the M7220 main battery is charging.
- Indicates the spare battery is charging.

When the battery charging LED is red, the battery is charging. When the battery charge LED is green the battery is fully charged. A fully discharged battery takes about 6 hours to completely recharge.

The M7220 Cradle's Communication Ports

The M7220 hand-held terminal has 2 different styles of communications ports, RS-232 (RJ-45) and USB (Type II). The M7220 Cradle also has 2 communications ports, RS-232 (DB-9) and USB (Type II). The M7220 Communications Cradle uses a standard RS-232 (DB-9 Male – DB-9 Female) cable.

ACC-5925 Cradle

Both communication connectors on the back of the M7220 cradle are wired "straight through". This means that the communications settings on the M7220 handheld terminal will determine the settings on the communication cradle. The M7220 Cradle has no internal or external settings that can be changed.

The high speed USB data port is used to load a new or updated operating system or settings into the M7220 hand-held.

DB-9 Pin out (RS-232)

1 – DCD (Data Carrier Detect)
2 – RXD (Receive Data)
3 – TXD (Transmit Data)
4 – DTR (Data Terminal Ready)
5 - GND (Signal Ground)
6 – DSR (Data Set Ready)
7 – RTS (Request To Send)
8 –CTS (Clear To Send)
9 – NC (No Connection)

Chapter 2

The M7220 Menu System

Overview

The M7220 uses a modern menu system to access its available features and settings. From an active telnet or browser session, the menu can be accessed by pressing the [Menu] key. Subsequent presses of the [Menu] key will cycle through the available menus, described below.

The menu system also shows some basic information about the status of the system along the left and right sides of the screen:

All of the M7220 options, applications, and features are divided into five primary menu catagories:

"Connect / Reconnect"
"Tools & Utilities"
"Preferences"
"Administration"
"Diagnostics"

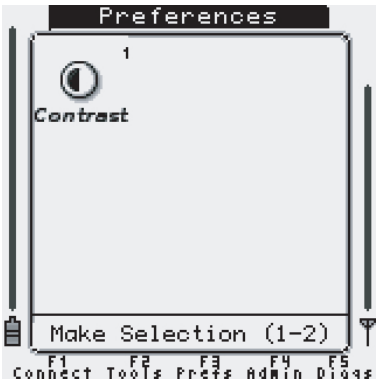
Alternative to cycling through the menus via the [Menu] key, the function keys can be used to quickly access any desired menu.

With the 55-key Alpha-numeric keypad, pressing the [Func] key followed by the designated number key will jump the screen to the desired menu. The M7220 35-key Numeric keypad has discrete function keys that can be directly pressed.

F1 - "Connect / Reconnect" - Starting or Re-starting a configured TELNET or browser session

F2 - "Tools & Utilities" - System tools and useful applications (Calculator, Bar Code Data Viewer, etc...)

F3 - "Preferences" - End user preferences (Contrast, etc...)



F4 - "Administration" - M7220 system-wide setup (Wireless Networking, Power Management, Telnet session setup, etc...)

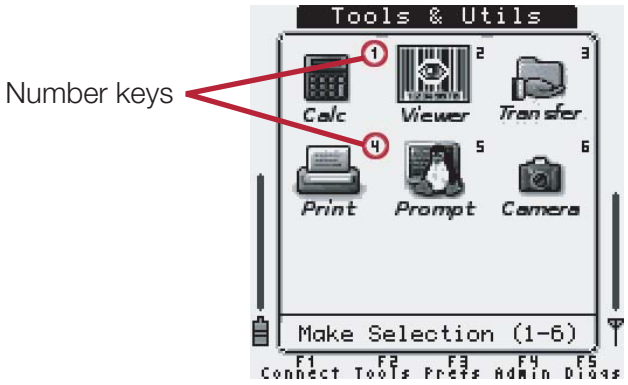
F5 - "Diagnostics" - Advanced debugging and diagnostic tools (Software versions, Network Status, Hardware Tests, etc...)

From any primary menu, pressing [Esc] will bring the screen back the the "Connect" menu.

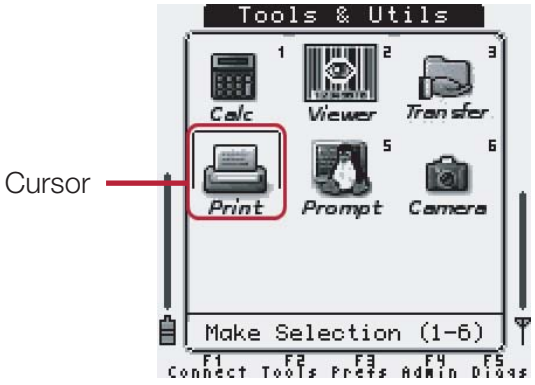
Navigating the Primary and Icon Menus

All of the primary menus, with the exception of the "Connect / Reconnect" menu and along with some of the "Administration" options, use a series of icons and graphics to allow for easy identification of the available items. Each of these items can be selected in a variety of ways to allow for easy access no matter the keyboard layout or operator preference.

Normal selection is done via the numeric keys, as each icon displays a small number on the top right of its identifying graphic. The number keys on the keyboard correspond to these numbers and can be directly pressed to access the desired function.



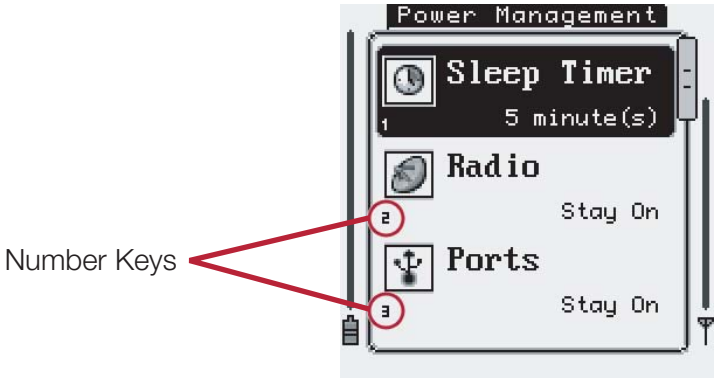
Alternatively, the arrow keys can be used to move through the icons and pressing [ENTER] will activate the selected function. Once an arrow key has been pressed, an icon cursor will be visible around the currently selected graphic.



Navigating the Settings Menus and "Connect / Reconnect"

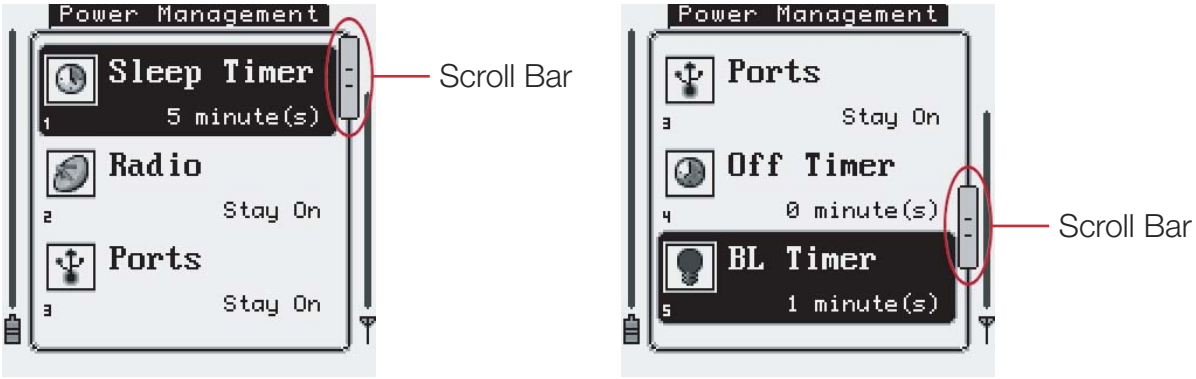
Some menus are not well suited for icon and graphical display, either due to complexity or simply the number of required actions. These menus are displayed using a list format with an emphasis on text over graphical representation.

Like with the icon menus, there are a variety of ways to access functions within these menus. Each item in the menu displays a small number on the bottom left of the action/option. Again, this number corresponds to the keyboard's numeric keys. Pressing the desired number on the keyboard will activate the corresponding option.



Furthermore, the [Up] and [Down] arrow keys can be used to move through the list of options. The [Enter] key can be used to activate the highlighted option.

When a menu contains more available options or actions than can be displayed at once on the screen, a small scroll bar will appear on the right side of the menu. This scroll bar denotes the approximate location of the currently selected option within the menu.



If the option activates a function (as from the "Connect / Reconnect" menu) or enters a deeper menu (as from the "Host Servers" menu), a small arrow will be displayed to the right of the option name.

Some settings options depend on other settings' values. When these "dependencies" are not fulfilled for an option, that option will be displayed in a lighter color and will not be available to be modified or activated. For example, within the "Wireless Security" settings, if the Encryption option is not set to "WPA/WPA2", the WPA Type option will be grayed out, as it is not relevant in this case.

Controlling Options and Settings

The M7220 "Administration" menu allows the user to modify the hand-held's system settings and user options. As with any PC application, the M7220 main menu system uses a series of "widgets" to allow easy setup of different types of settings (i.e. some options need to be entered as text, while others are simply a "check-box" type of item that only needs to be either enabled or disabled). The M7220 widgets are described below.

Boolean / Enable-Disable:

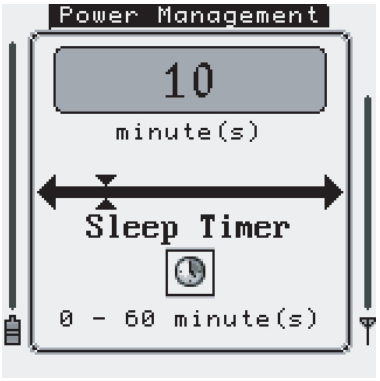
Pressing [Enter] while this type of option is selected or by pressing its corresponding numeric key will alter the options setting between "Enabled" and "Disabled".

Combo / Multiple Options:

Pressing [Enter] while this type of option is selected or by pressing its corresponding numeric key will open a small menu and allow the selection (again via the numeric keys or the [Up]/[Down] and [Enter] keys) of multiple options. Note that some options that only have two different selections will act like the above mentioned Boolean type, but will display the options custom text as opposed to the normal "Enabled" or "Disabled". If more selections are available than can be shown on the screen, again a scroll bar will be drawn on the right of the menu.

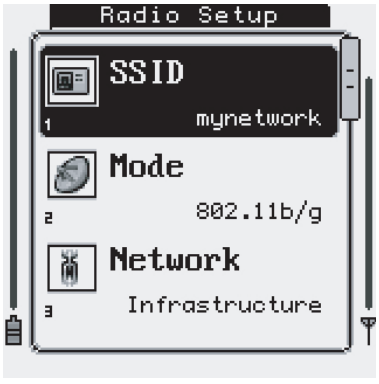
Sliders / Numeric Options:

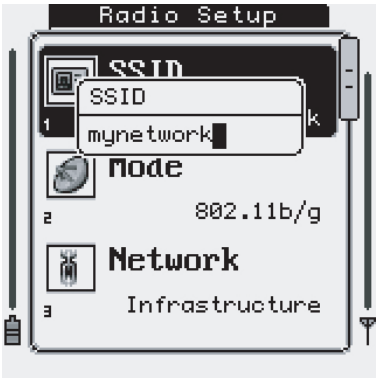
Pressing [Enter] while this type of option is selected or by pressing its corresponding numeric key will display a screen with the option name and a numeric slider. Using the [Left]/[Right] or [Up]/[Down] keys will increase and decrease the options value. The minimum and maximum values are displayed at the bottom of the screen.



Text Entry:

Pressing [Enter] while this type of option is selected or by pressing its corresponding numeric key will open a small text entry menu that will allow typing of text into the option value.





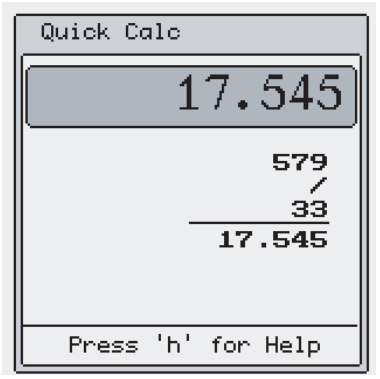
Pressing the [Esc] key or the [0] numeric key will exit any menu and return to the previously viewed screen. Note that when exiting back to the "Administration" menu, the options that were set will automatically be saved, and if any action is required, it will automatically be carried out (i.e. if the user changes the embedded HTTP server from "Disabled" to "Enabled", the system will automatically save the new settings and start the HTTP server when leaving the "Startup/Boot Options" menu). A beep will be sounded and a small message will be displayed briefly to signify that the settings were correctly saved.

M7220 Connect / Reconnect Menu

When the M7220 first powers up, the unit will automatically attempt to connect to the host server. If more than one host connection is configured, the user will be prompted with the Connect menu, allowing them to select which server to connect to. If exactly two host connections have been configured, the "Connect to Both" option will be available.

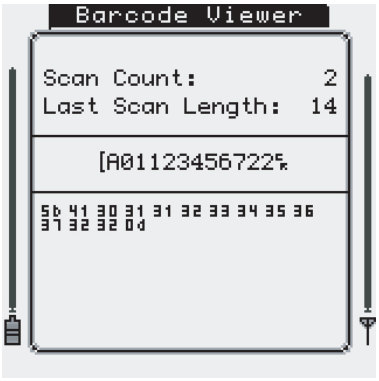
M7220 Tools & Utilities Menu

1) Calculator



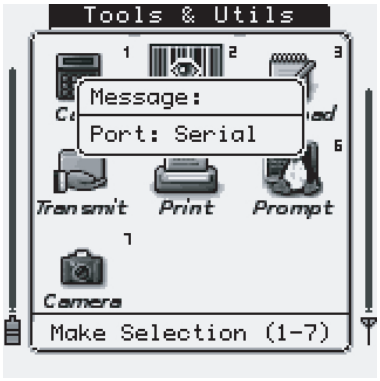
The M7220 contains a simple, easy to use calculator. It can do simple mathematical functions by simply typing data from the keypad. Press [Menu] to return to the M7220 menu system.

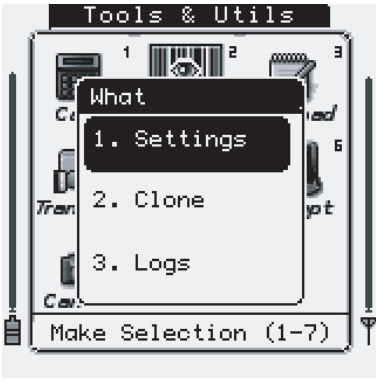
2) Barcode Viewer

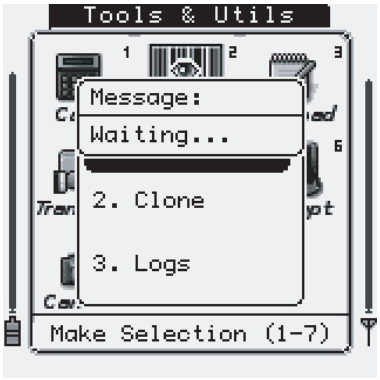


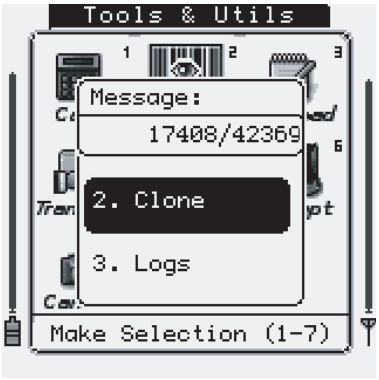
The Barcode Data Viewer displays the data aquired by the bar code scanner, including non-printable characters. The display shows both the printed values, as well as the hex encoded ASCII. Press [Esc] to exit the Viewer.

3) Transmit









The Transmit applet allow the user to transmit the M7220 settings files to a PC. Make sure that at least one port in the Port Settings menu is set to "Data Uplink" before attempting to transmit.

4) Print

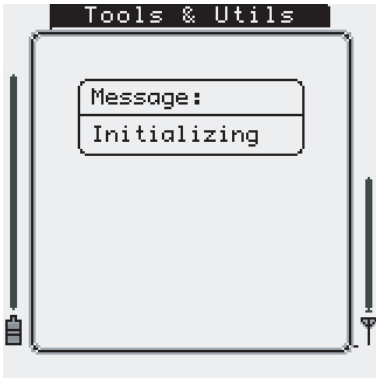
The Print Utility allows testing of a serial printer.

5) Linux Prompt

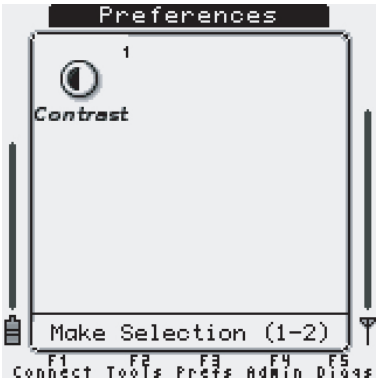
The Linux Prompt function puts the M7220 computer into its native Linux command line operating mode. Most of the standard GNU/Linux tools and commands are available.

6) Camera

If the M7220 is equipped with the optional 2-Dimensional Imager, the Camera utility can be used to capture a 640x480 JPEG image. Once captured the image will be stored in volatile RAM and will be erased upon power down. The location of the image is /tmp/picture.jpg.



M7220 User Preferences Menu



The Preferences menu is used for user definable settings that are not password protected.

1) Contrast

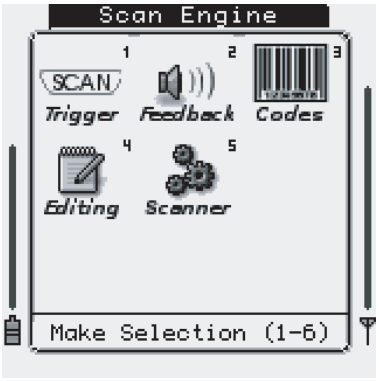
The contrast function can be used to adjust the light/dark contrast. Use the [+] and [-] keys (or the [A] and [B] keys) to make adjustments to the contrast. Pressing [Esc] will exit the applet and save the setting.

M7220 Administration Menu

The M7220 Administration menu houses all of the system's operating parameters, and from this menu, the entire system can be modified for use. Since the M7220 contains hundreds of customizable options, each parameter is categorized into one of nine major groups, and some into smaller sub-sections. This allows each setting to be modified in a quickly and easily.

The nine major settings groups are:

1) Scanner Options



The Scanner Options group contains all aspects of the bar code decoder and data capture device. Within this menu are five sub groups: Trigger, Feedback, Codes (Symbologies), Editing, and General Setup.

The Trigger options give control over the aiming dot and laser timers, as well as the trigger's mode. These options are usually set up to the user's personal preference and they have no affect on the actual data that is collected via the scanner.

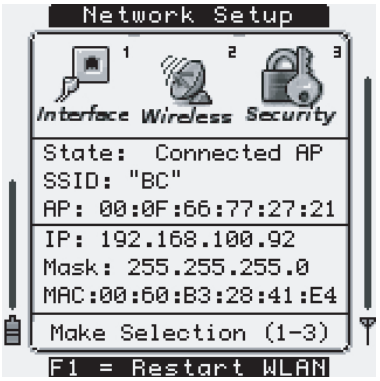
The Feedback settings allow modification to the audio beeps that sound during bar code scanning. Changes can be made to the pitch, length, and count of the beeps that sound when a good and/or bad bar code read is completed.

Symbology control and settings are modified from the Codes section. This section also contains many subsections, depending on the scan engine that is installed in the M7220. For laser bar code readers, the menu will contain all symbologies that the scan engine can decode, and allow for changes to many aspects of the data. With the 2-Dimensional Imager installed, the symbologies are divided once again into further sections of Linear, Postal, 2-D, and OCR fonts.

The Editing section give control over customizing the data collected after it has been scanned. Example options include stripping leading and trailing characters and adding prefixes and suffixes. Bar code editing can be done on a global scale where all bar codes are affected, or it can be done on a symbology type basis. Up to four custom symbology type edits can be made on the M7220, along with a global edit.

General Setup gives control over global termination characters appended to the bar code data, along with some scan engine specific settings like LED illumination with the 2-D Imager.

2) Network Setup

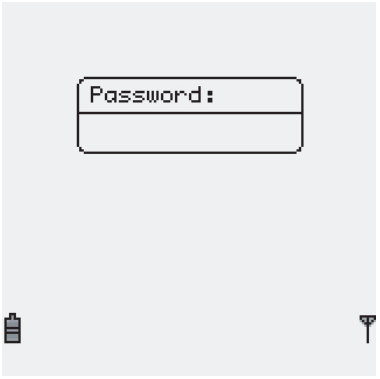


3) Port Options

The M7220 contains two different user accessible ports: USB Slave (Type-B) and RS-232 serial.

4) Security Options

The M7220 allows for two different types of password protection. A power-up (boot) password requires that the user enter a password to initialize the M7220 for use.



The Settings Password, if enabled, requires the user to enter a password to authorize changes in the settings. It is always a good idea to enable a Settings Password to prevent users from modifying the unit's settings.

**NOTE: If a Settings Password is set, the M7220's embedded website password will also be changed to this password. If no Settings Password is set, then the embedded website password defaults to 'aml'.*

Once the user enters the Settings Password, they will not be asked again for it until completely exiting the Administration menu.

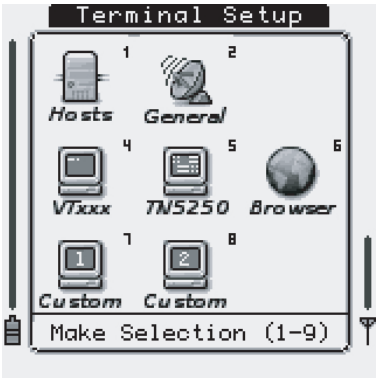
5) Power Options

The M7220 has advanced power management features that enable fine tuning of the battery usage. The unit has an advanced sleep/suspend mode that can be tailored to any specific situation. Even in sleep mode, the M7220 can leave the internal 802.11b/g radio on to keep the association with the access point.

6) Keyboard Options

The M7220 has the ability to globally customize the function keys on the keyboard. These modifications are to the actual Linux kernel keyboard mapping, giving a huge amount of control over the keys. See the Keyboard Option Parameters table for information on customizing these keys.

7) Terminal Emulation and Host Connection Options



The M7220 comes standard with a VT100/VT220 interpretor, a TN5250 emulator, a standards compliant web browser, an AML CommandLink interpretor (AMLterm), and an SSH client. Any of these applications/emulators can be used to connect to remote network servers through the Connect / Reconnect menu. From here in the Terminal Options menu, this connection menu can be set up.

Each different application has its own set of options and parameters that are accessible through options four through eight. Their parameters are defined below in the Host / Terminal Setup table.

**NOTE: For information on using the SSH client, see the SSH Client Setup section of this manual.*

Setting up a new connection is done through the Hosts sub-menu. It will present a list of connections (up to eight connections can be defined) that can be modified to suit the installation's needs. Selecting one of the eight host connections will display the host options including IP address, Application / Terminal to use for the connection, and other connection specific parameters that may differ between host servers. If the Terminal is set to any option other than Disabled, it will be visible on the Connect / Reconnect menu.

8) Audio Options

The audio options allows control of the global system sound (including all bar code feedback beeps, all warning beeps, and all keyboard ticks), along with the ability to modify the sound emitted when the keyboard is in use.

9) Startup / Boot Options

The Startup options give control over the system's services and servers that will be started on boot. They include a standard TELNET server, SSH / SFTP server, FTP server, embedded HTTP server, and the bar code scanner manager.

It is highly recommended that the TELNET and FTP server be left disabled and encrypted SSH and SFTP be used in their place.

For the TELNET, SSH / SFTP, and FTP server, the default username is 'root' and the password is 'aml'.

The embedded HTTP server can be used to view the M7220 system status and logs, update the firmware, and upload settings files. Furthermore, it has the ability to display a live image of what the operator is currently viewing on the screen.

If the unit's security settings have the Settings Password enabled, it will be used as the password to access the embedded HTTP server's page. If the Settings Password is not enabled, the default HTTP password of 'aml' will be used.

For more information on the HTTP server and the HTML pages can be found in the M7220 Embedded Website section.

Complete M7220 Option Parameters

Section	Setting Parameter	Available Options	Option Description
Trigger Options	Trigger Mode	1.) Trigger	Laser on only when trigger is pressed
		2.) Pulse	Laser will stay on for <Laser Timer> time even after trigger release
	Laser Timer	Min: 1 second	Maximum laser on time
		Max: 10 seconds	
	Aim Mode	1.) Disabled	Aimer disabled
		2.) Timer	Specified aim time
		3.) Pull-Release	Aim during trigger press, decode after trigger release
	Aim Timer	Min: 0 seconds	Time aimer should be enabled when Aim Mode is Timer (2)
		Max: 5 seconds	
User Feedback	Good Tone	1.) Disabled	No good read tone
		2.) Low	Low-pitched tone
		3.) Medium	Mid-pitched tone
		4.) High	High-pitched tone
	Good Beep	1.) Chirp	Very short beep
		2.) Short	Short beep
		3.) Medium	Medium beep
		4.) Long	Long Beep
	Good Count	1.) 1	One Beep
		2.) 2	Two Beeps
		3.) 3	Three Beeps
	Timeout Tone	1.) Disabled	No bad read tone
		2.) Low	Low-pitched tone
		3.) Medium	Mid-pitched tone
		4.) High	High-pitched tone
	Timeout Beep	1.) Chirp	Very short beep
		2.) Short	Short Beep
		3.) Medium	Medium Beep
		4.) Long	Long Beep
	Timeout Count	1.) 1	One Beep
		2.) 2	Two Beeps
		3.) 3	Three Beeps

Complete M7220 Option Parameters - cont'd.

Section	Setting Parameter	Available Options	Option Description
Bar Code Editing (Global / Custom 1- 4)	Global Edit / Custom	Enabled/Disabled	Enable a bar code edit
	Type (Custom Only) * denotes 2D Imager code only	1.) Code 128	Affects Code 128
		2.) Code 39	Affects Code 39
		3.) EAN/UPC	Affects EAN & UPC
		4.) Int 2of5	Affects Interleaved 2 of 5
		5.) MSI	Affects MSI & Plessy
		6.) GS1/RSS	Affects GS1 (RSS)
		7.) IATA 2of5	Affects Straight 2 of 5
		8.) Codabar	Affects Codabar
		9.) Code 11	Affects Code 11
		10.) *Aztec	Affects Aztec
		11.) *Codablock	Affects Codablock
		12.) *Code 16k	Affects Code 16k
		13.) *DataMatrix	Affects DataMatrix
		14.) *QR Code	Affects QR Code
		15.) *MaxiCode	Affects MaxiCode
		16.) *Telepen	Affects Telepen
		17.) *Posicode	Affects Posicode
		18.) *PDF417	Affects PDF-417 and MicroPDF-417
		19.) *Code 49	Affects Code 49
		20.) *OCR	Affects OCR
	Strip Leading	Min: 0 Characters	Strip characters at the beginning of bar code
		Max: 255 Characters	
	Strip Trailing	Min: 0 Characters	Strip characters at the end of bar code
		Max: 255 Characters	
	Strip Spaces	1.) Disabled	Strip spaces at the beginning and end of bar code
		2.) Leading/Trailing	
	Prefix	(Text entry)	String to add to beginning of bar code data
	Suffix	(Text entry)	String to add to end of bar code data

Complete M7220 Option Parameters - cont'd.

Section	Setting Parameter	Available Options	Option Description
Scanner Setup	Type ID	1.) Disabled	Do not send a type ID character
		2.) AML	Prefix AML Type ID *See AML Type ID Table
		3.) AIM	Prefix AIM Type ID *See AIM Type ID Table
		1.) Disabled	No termination character
		2.) Tab	Append ASCII Tab (0x09)
		3.) CR	Append ASCII Carriage Return (0x0d)
		4.) LF	Append ASCII Line Feed (0x0a)
		5.) Fexit	Append Field Exit / ASCII Vertical Tab (0x0b)
		6.) Custom	Use custom character
	Custom Character 1	Min: 0 (decimal ASCII)	Set termination character 1 to the ASCII decimal equivalent
		Max: 255 (decimal ASCII)	
	Term Char 2	1.) Disabled	No termination character
		2.) Tab	Append ASCII Tab (0x09)
		3.) CR	Append ASCII Carriage Return (0x0d)
		4.) LF	Append ASCII Line Feed (0x0a)
		5.) Fexit	Append Field Exit / ASCII Vertical Tab (0x0b)
		6.) Custom	Use custom character
	Custom Character 2	Min: 0 (decimal ASCII)	Set termination character 2 to the ASCII decimal equivalent
		Max: 255 (decimal ASCII)	
	Scan Angle (Standard High Speed Laser only)	1.) Narrow	Set raster angle to 35 degrees
		2.) Wide	Set raster angle to 47 degrees
	Illumination (2-D Imager Only)	Enabled/Disabled	Enable LED Illumination of bar code
	LED Power (2-D Imager Only)	1.) Off	0% LED brigtness
		2.) Low	50% LED brightness
		3.) High	100% LED brightness
	AIM Mode (2-D Imager Only)	1.) Disabled	Disable aiming bar
		2.) Concurrent	Illumination LEDs on continuously, aimer disables on exposure (NOT RECOMMENDED DUE TO POWER COMSUMPTION)
		3.) Interlaced	Illumination LEDs only on during exposure, aimer only on in between exposures

Complete M7220 Option Parameters - cont'd.

Section	Setting Parameter	Available Options	Option Description
Scanner Setup	Multi-Decode (2-D Imager Only)	Enabled/Disabled	Enable/Disable multiple symbol decoding in single exposure
	Orientation (2-D Imager Only)	1.) Upright	Normal
		2.) 90 CW	90 Degrees Clockwise
		3.) Upside Down	Inverted (the natural position when holding the M7220 normally)
		4.) 90 CCW	90 Degrees Counter Clockwise

Bar Code Type ID's

Symbology	AML Type ID	AIM Type ID
EAN/UPC	B,C,D	]E
Code 39	A	]A
Codabar	G	]F
Code 128	H	]C
Code 93	I	]G
Interleaved 2 of 5	F	]I
Discrete 2 of 5	P	]S
Code 11	K	]H
MSI/Plessy	J	]M
GS1 (RSS)	M,N,O	]e
Other/Unknown	X	]X

*All AML Type IDs are followed with a space
*All AIM Type IDs are following with an AIM Modifier digit

Laser Symbology Settings (SR, LR, ALR)

Section	Setting Parameter	Available Options	Option Description
EAN-UPC	UPC-A	Enabled/Disabled	Enable/Disable decoding of UPC-A symbols
	UPC-E	Enabled/Disabled	Enable/Disable decoding of UPC-E symbols
	UPC-E1	Enabled/Disabled	Enable/Disable decoding of UPC-E1 symbols
	EAN-8	Enabled/Disabled	Enable/Disable decoding of EAN-8 symbols
	EAN-13	Enabled/Disabled	Enable/Disable decoding ofEAN-13 symbols
	Bookland	Enabled/Disabled	Enable/Disable decoding of Bookland symbols
	Supplements	1.) Decode	Require supplements for good decoding
		2.) Ignore	Ignore supplements
		3.) 378/379	Only decode EAN-13 supplements that start with 378 or 379
		4.) 978	Only decode EAN-13 supplements that start with 978
		5.) Automatic	Automatically determine if supplement is available, decode if possible
		6.) Smart	EAN-13 supplements with 378, 379, or 978 are decoded
	A Check Digit	1.) Verify	Verify but do not transmit UPC-A check digit
		2.) Transmit	Verify and transmit UPC-A check digit
	E Check Digit	1.) Verify	Verify but do not transmit UPC-E check digit
		2.) Transmit	Verify and transmit UPC-E check digit
	E1 Check Digit	1.) Verify	Verify but do not transmit UPC-E1 check digit
		2.) Transmit	Verify and transmit UPC-E1 check digit
	UPC-A Preamble	1.) None	No UPC-A Preamble
		2.) System Character	Send number system (0 or 1) prefix
		3.) Country Code + System Character	Send number system (0 or 1) prefix and country code (0 for US)

Laser Symbology Settings (SR, LR, ALR) - cont'd.

Section	Setting Parameter	Available Options	Option Description
EAN-UPC (cont'd)	UPC-E Preamble	1.) None	No UPC-E Preamble
		2.) System Character	Send number system (0 or 1) prefix
		3.) Country Code + System Character	Send number system (0 or 1) prefix and country code (0 for US)
	UPC-E1 Preamble	1.) None	No UPC-E Preamble
		2.) System Character	Send number system (0 or 1) prefix
		3.) Country Code + System Character	Send number system (0 or 1) prefix and country code (0 for US)
	E Conversion	1.) None	Send UPC-E bar code data as scanned
		2.) To UPC-A	Zero pad UPC-E to UPC-A
	E1 Conversion	1.) None	Send UPC-E1 bar code data as scanned
		2.) To UPC-A	Zero pad UPC-E1 to UPC-A
	EAN Zero Pad	Enabled/Disabled	Pad EAN-8 with 5 zeros to convert into EAN-13
	EAN-8 Label	1.) EAN-8	Keep EAN-8 type ID when zero padded to EAN-13
		2.) EAN-13	Use EAN-13 type ID when zero padded to EAN-13
	UCC Coupon	Enabled/Disabled	Enable/Disable decoding of UCC Coupon codes
Code 128	Code 128	Enabled/Disabled	Enable/Disable decoding of Code 128 symbols
	EAN-128	Enabled/Disabled	Enable/Disable decoding of EAN-128 symbols
	ISBT 128	Enabled/Disabled	Enable/Disable decoding of ISBT 128
Code 39	Code 39	Enabled/Disabled	Enable/Disable decoding of Code 39 symbols
	Data Length 1	Min: 0 characters	** See Laser Data Lengths Note
		Max: 48 characters	
	Data Length 2	Min: 0 characters	
		Max: 48 characters	

Laser Symbology Settings (SR, LR, ALR) - cont'd.

Section	Setting Parameter	Available Options	Option Description
Code 39 (cont'd)	Trioptic 39	Enabled/Disabled	Enable/Disable decoding of Tri-optic brand symbols (used in magnetic tape identification)
	Conversion	1.) Disabled	No Code 39 to Code 32 conversion
		2.) To Code 32	Convert data into Code 32 (Italian Pharmacode) format
	Code 32 Prefix	Enabled/Disabled	Add the Code 32 Prefix (A)when converting from Code 39 to Code 32
	Check Digit	1.) Ignore	Ignore Code 39 Check digit
		2.) Verify	Verify Code 39 Check digit
		3.) Transmit	Verify and Transmit Code 39 Check digit
	Code 39 ASCII	Enabled/Disabled	Enable Full ASCII support in Code 39
Code 93	Code 93	Enabled/Disabled	Enable/Disable decoding of Code 93 symbols
	Data Length 1	Min: 0 characters	** See Laser Data Lengths Note
		Max: 50 characters	
	Data Length 2	Min: 0 characters	
		Max: 50 characters	
Code 11	Code 11	Enabled/Disabled	Enable/Disable decoding of Code 11 symbols
	Data Length 1	Min: 0 characters	** See Laser Data Lengths Note
		Max: 80 characters	
	Data Length 2	Min: 0 characters	
		Max: 80 characters	
	Check Digits	1.) Ignore	Ignore Code 11 check digits
		2.) One	Verify first Code 11 check digit
		3.) Two	Verify both Code 11 check digits
	Tx Check Digit	Enabled/Disabled	Enable/Disable the transmission of the verified check digit(s)
2 of 5	Int 2of5	Enabled/Disabled	Enable/Disable decoding of Interleaved 2 of 5 symbols
	Check Digits	1.) Ignore	Ignore Interleaved 2 of 5 check digit
		2.) USS	Use Uniform Symbology Specification algorithm
		3.) OPCC	Use Optical Product Code Council algorithm
	Tx Check Digit	Enabled/Disabled	Enable/Disable the transmission of the verified check digit

Laser Symbology Settings (SR, LR, ALR) - cont'd.

Section	Setting Parameter	Available Options	Option Description
2 of 5 (cont'd)	Data Length 1 (I2o5)	Min: 0 characters	** See Laser Data Lengths Note
		Max: 65 characters	
	Data Length 2 (I2o5)	Min: 0 characters	
		Max: 65 characters	
	Conversion	1.) None	No conversion of Interleaved 2 of 5 symbols
		2.) To EAN-13	Convert 14 character Interleaved 2 of 5 symbols to EAN-13 (Data Length 1 must be 14, symbol must have leading zero and valid EAN-13 Check digit)
	Discrete 2of5	Enabled/Disabled	Enable/Disable decoding of Discrete 2 of 5 (Industrial) symbols
	Data Length 1 (D2o5)	Min: 0 characters	** See Laser Data Lengths Note
		Max: 65 characters	
	Data Length 2 (D2o5)	Min: 0 characters	
		Max: 65 characters	
	Chinese 2of5	Enabled/Disabled	Enable/Disable decoding of Chinese / Hong Kong 2 of 5 symbols
Codabar	Codabar	Enabled/Disabled	Enable/Disable decoding of Codabar symbols
	Data Length 1	Min: 0 characters	** See Laser Data Lengths Note
		Max: 60 characters	
	Data Length 2	Min: 0 characters	
		Max: 60 characters	
	Codabar Editing	1.) Disabled	Transmit Codabar symbol data as scanned
		2.) CLSI	CLSI editing: Strip start/stop, insert space after first, fifth, and tenth character of 14 character bar code
		3.) NOTIS	NOTIS editing: Strip start/stop characters of all Codabar symbols
		4.) CLSI+NOTIS	Enable both CLSI and NOTIS editing
MSI / Plessy	MSI	Enabled/Disabled	Enable/Disable decoding of MSI / Plessy symbols
	Data Length 1	Min: 0 characters	** See LaserData Lengths Note
		Max: 48 characters	
	Data Length 2	Min: 0 characters	
		Max: 48 characters	

Laser Symbology Settings (SR, LR, ALR) - cont'd.

Section	Setting Parameter	Available Options	Option Description
MSI / Plessy (cont'd)	Check Digits	1.) One	Verify single check digit
		2.) Two	Verify two check digits
	Tx Check Digit	Enabled/Disabled	Enable/Disable the transmission of the verified check digit(s)
	Algorithm	1.) Mod10/Mod11	Use Mod 11 for second check digit
		2.) Mod10/Mod10	Use Mod 10 for second check digit
GS1 Databar (formerly RSS)	GS1 14	Enabled/Disabled	Enable/Disable decoding of GS1 Databar (14) symbols
	GS1 Limited	Enabled/Disabled	Enable/Disable decoding of GS1 Limited symbols
	GS1 Expanded	Enabled/Disabled	Enable/Disable decoding of GS1 Expanded symbols
	GS1 Conversion	1.) None	No conversion on GS1 symbols
		2.) To UPC/EAN	Convert GS1 Databar (14) and GS1 Limited: Symbols with one leading 0 will have leading 3 characters stripped and type ID set to EAN-13; Symbols with two or more leading zeros will have the leading four characters stripped and the type ID set to UPC-A

**Laser Data Lengths Explanation

Desired Action	Data Length 1	Data Length 2
Allow only one discrete length bar code	Discrete length of symbol to decode	0 (Zero)
Allow two discrete lengths	Higher length value	Lower length value
Lengths within a range are decoded	Lower length value	Higher length value
Any length bar code is decoded within laser capability	0 (Zero)	0 (Zero)

2-Dimensional Imager Symbology Settings

Type	Symbology	Setting Parameter	Available Options	Option Description
LInear	EAN	EAN-13	Enabled/Disabled	Enable/Disable decoding ofEAN-13 symbols
		EAN-13 Chk Dig	Enabled/Disabled	Enable/Disable Transmission of EAN-13 Check Digit
		EAN-13 Supp (2)	Enabled/Disabled	Allow 2 digit supplements to EAN-13
		EAN-13 Supp (5)	Enabled/Disabled	Allow 5 digit supplements to EAN-13
		EAN-13 Supps (Req)	1.) Required	Do not require the EAN-13 supplement
			2.) Not Required	Require EAN-13 supplement for decoding
		EAN-13 Supps (Sep)	1.) Add Separator	Add a space between the EAN-13 code and the supplement
			2.) No Separator	Do not add a space between the code and supplement
		EAN-13 ISBN	Enabled/Disabled	Enable/Disable translation of EAN-13 ISBN data
		EAN-8	Enabled/Disabled	Enable/Disable decoding ofEAN-8 symbols
		EAN-8 Chk Dig	Enabled/Disabled	Enable/Disable Transmission of EAN-8 Check Digit
		EAN-8 Supp (2)	Enabled/Disabled	Allow 2 digit supplements to EAN-8
		EAN-8 Supp (5)	Enabled/Disabled	Allow 5 digit supplements to EAN-8
		EAN-8 Supps (Req)	1.) Required	Do not require the EAN-8 supplement
			2.) Not Required	Require EAN-8 supplement for decoding
		EAN-8 Supps (Sep)	1.) Add Separator	Add a space between the EAN-8 code and the supplement
			2.) No Separator	Do not add a space between the code and supplement
	UPC	UPC-A	Enabled/Disabled	Enable/Disable decoding ofUPC-A symbols
		UPC-A Chk Dig	Enabled/Disabled	Enable/Disable Transmission of UPC-A Check Digit
		UPC-A NumSys	Enabled/Disabled	Send number system (0 or 1) prefix
		UPC-A Supp (2)	Enabled/Disabled	Allow 2 digit supplements to UPC-A
		UPC-A Supp (5)	Enabled/Disabled	Allow 5 digit supplements to UPC-A

2-Dimensional Imager Symbology Settings - cont'd.

Type	Symbology	Setting Parameter	Available Options	Option Description
LInear (cont'd)	UPC (cont'd)	UPC-A Supps (Req)	1.) Required	Do not require the UPC-A supplement
			2.) Not Required	Require UPC-A supplement for decoding
		UPC-A Supps (Sep)	1.) Add Separator	Add a space between the UPC-A code and the supplement
			2.) No Separator	Do not add a space between the code and supplement
		UCC Coupon	Enabled/Disabled	Enable/Disable EAN-13/UPC-A with exteneded UCC Coupon
		UPC-E	Enabled/Disabled	Enable/Disable decoding ofUPC-E symbols
		UPC-E Expand	Enabled/Disabled	Enable/Disable expanding UPC-E to full UPC-A form
		UPC-E Supps (Req)	1.) Required	Do not require the UPC-E supplement
			2.) Not Required	Require UPC-E supplement for decoding
		UPC-A Supps (Sep)	1.) Add Separator	Add a space between the UPC-E code and the supplement
			2.) No Separator	Do not add a space between the code and supplement
		UPC-E Chk Dig	Enabled/Disabled	Enable/Disable Transmission of UPC-E Check Digit
		UPC-E NumSys	Enabled/Disabled	Send number system (0 or 1) prefix
		UPC-E Supp (2)	Enabled/Disabled	Allow 2 digit supplements to UPC-E
		UPC-E Supp (5)	Enabled/Disabled	Allow 5 digit supplements to UPC-E
		UPC-E1	Enabled/Disabled	Enable/Disable decoding ofUPC-E1 symbols
	Code 128	Code 128	Enabled/Disabled	Enable/Disable decoding ofCode 128 symbols
		ISBT Concat	Enabled/Disabled	Enable/Disable the Concatenation feature of ISBT 128 Symbols
		Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 80 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 80 characters	

2-Dimensional Imager Symbology Settings - cont'd.

Type	Symbology	Setting Parameter	Available Options	Option Description
LInear (cont'd)	Code 39	Code 39	Enabled/Disabled	Enable/Disable decoding of Code 39 symbols
		Start/Stop	1.) Skip	Do not transmit start and stop characters
			2.) Transmit	Transmit the start and stop characters
		Check Digit	1.) Ignore	Ignore Code 39 check digits
			2.) Verify	Verify but do not transmit Code 39 check digits
			3.) Transmit	Verify and transmit Code 39 check digits
		Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 48 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 48 characters	
		Append Mode	Enabled/Disabled	Allow Code 39 multiple bar code concatenation
		Code 32	Enabled/Disabled	Enable/Disable conversion of data into Code 32 (Italian Pharmacode)
		Full ASCII	Enabled/Disabled	Enable/Disable full ASCII support for Code 39
	Code 93	Code 93	Enabled/Disabled	Enable/Disable decoding of Code 93 symbols
		Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 80 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 80 characters	
	Code 11	Code 11	Enabled/Disabled	Enable/Disable decoding of Code 11 symbols
		Check Digit	1.) Single	One check digit verification
			2.) Double	Two check digit verification
		Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 80 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 80 characters	

2-Dimensional Imager Symbology Settings - cont'd.

Type	Symbology	Setting Parameter	Available Options	Option Description
LInear (cont'd)	2 of 5	Interleaved	Enabled/Disabled	Enable/Disable decoding of Interleaved 2 of 5 symbols
		Check Digit	1.) Ignore	Ignore check digits
			2.) Verify	Verify but do not transmit check digits
			3.) Transmit	Verify and transmit check digits
		Interleaved Min	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 80 characters	
		Interleaved Max	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 80 characters	
		Industrial	Enabled/Disabled	Enable/Disable decoding of Industrial 2 of 5 symbols
		Industrial Min	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 48 characters	
		Industrial Max	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 48 characters	
		IATA	Enabled/Disabled	Enable/Disable decoding of IATA 2 of 5 symbols
		IATA Min	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 48 characters	
		IATA Max	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 48 characters	
		Matrix	Enabled/Disabled	Enable/Disable decoding of Matrix 2 of 5 symbols
		Matrix Min	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 80 characters	
		Matrix Max	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 80 characters	
	Codabar	Codabar	Enabled/Disabled	Enable/Disable decoding of Codabar symbols
		Start/Stop	1.) Skip	Do not transmit start and stop characters
			2.) Transmit	Transmit start and stop characters
		Check Digit	1.) Ignore	Ignore check digits
			2.) Verify	Verify but do not transmit check digits
			3.) Transmit	Verify and transmit check digits
		Concatenate	1.) Off	Do not allow Codabar concatenation
			2.) On	Allow concatenation
			3.) Required	Require symbols to be concatenated

2-Dimensional Imager Symbology Settings - cont'd.

Type	Symbology	Setting Parameter	Available Options	Option Description
LInear (cont'd)	Codabar (cont'd)	Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 60 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 60 characters	
	MSI/Plessy	MSI	Enabled/Disabled	Enable/Disable decoding of MSI symbols
		MSI Check Digit	1.) Don't TX	Do not transmit the check character
			2.) Transmit	Transmit the check character
		MSI Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 48 characters	
		MSI Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 48 characters	
		Plessy	Enabled/Disabled	Enable/Disable decoding of Plessy symbols
		Plessy Min Len	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 48 characters	
		Plessy Max Len	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 48 characters	
	GS1 (RSS)	GS1 Databar	Enabled/Disabled	Enable/Disable decoding of GS1 Databar (14) symbols
		GS1 Limited	Enabled/Disabled	Enable/Disable decoding of GS1 Limited symbols
		GS1 Expanded	Enabled/Disabled	Enable/Disable decoding of GS1 Expanded symbols
		Expanded Min	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 74 characters	
		Expanded Max	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 74 characters	
	Telepen	Telepen	Enabled/Disabled	Enable/Disable decoding of Telepen symbols
		Telepen Output	1.) AIM Output	Decode as standard full ASCII
			2.) Original	Decode as compressed numeric
		Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 60 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 60 characters	

2-Dimensional Imager Symbology Settings - cont'd.

Type	Setting Parameter	Available Options	Option Description
Postal Codes	Postnet	Enabled/Disabled	Enable/Disable decoding of Postnet symbols
	Postnet Chk Dig	1.) Don't TX	Do not transmit the check character
		2.) Transmit	Transmit the check character
	Planet	Enabled/Disabled	Enable/Disable decoding of Planet symbols
	Planet Chk Dig	1.) Don't TX	Do not transmit the check character
		2.) Transmit	Transmit the check character
	UK Post	Enabled/Disabled	Enable/Disable decoding of UK Postal symbols
	Canada Post	Enabled/Disabled	Enable/Disable decoding of Canadian Postal symbols
	Kix Post	Enabled/Disabled	Enable/Disable decoding of Netherlands Postal symbols
	Australia Post	Enabled/Disabled	Enable/Disable decoding of Australian Postal symbols
	Japanese Post	Enabled/Disabled	Enable/Disable decoding of Japanese Postal symbols
	China Post	Enabled/Disabled	Enable/Disable decoding of Chinese Postal symbols
	China Min Len	Min: 0 characters	Minimum length in characters to allow a good read
		Max: 80 characters	
	China Max Len	Min: 0 characters	Maximum length in characters to allow a good read
		Max: 80 characters	
	Korea Post	Enabled/Disabled	Enable/Disable decoding of Korean Postal symbols
	Korea Min Len	Min: 0 characters	Minimum length in characters to allow a good read
		Max: 48 characters	
	Korea Max Len	Min: 0 characters	Maximum length in characters to allow a good read
		Max: 48 characters	

2-Dimensional Imager Symbology Settings - cont'd.

Type	Symbology	Setting Parameter	Available Options	Option Description
2-Dimensional	Codablock F	Codablock F	Enabled/Disabled	Enable/Disable decoding of Codablock F symbols
		Min Length	Min: 0 characters Max: 2048 characters	Minimum length in characters to allow a good read
		Max Length	Min: 0 characters Max: 2048 characters	Maximum length in characters to allow a good read
	Code 16k	Code 16k	Enabled/Disabled	Enable/Disable decoding of Code 16k symbols
		Min Length	Min: 0 characters Max: 160 characters	Minimum length in characters to allow a good read
		Max Length	Min: 0 characters Max: 160 characters	Maximum length in characters to allow a good read
	Code 49	Code 49	Enabled/Disabled	Enable/Disable decoding of Code 49 symbols
		Min Length	Min: 0 characters Max: 81 characters	Minimum length in characters to allow a good read
		Max Length	Min: 0 characters Max: 81 characters	Maximum length in characters to allow a good read
	PDF417	PDF417	Enabled/Disabled	Enable/Disable decoding of PDF417 symbols
		PDF417 Min Len	Min: 0 characters Max: 2750 characters	Minimum length in characters to allow a good read
		PDF417 Max Len	Min: 0 characters Max: 2750 characters	Maximum length in characters to allow a good read
		Micro417	Enabled/Disabled	Enable/Disable decoding of Micro PDF417 symbols
		Micro Min Len	Min: 0 characters Max: 366 characters	Minimum length in characters to allow a good read
		Micro Max Len	Min: 0 characters Max: 366 characters	Maximum length in characters to allow a good read

2-Dimensional Imager Symbology Settings - cont'd.

Type	Symbology	Setting Parameter	Available Options	Option Description
2-Dimensional	Composite	Composite	Enabled/Disabled	Enable/Disable decoding of EAN-UCC Composite symbols
		Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 2435 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 2435 characters	
		Emulation	1.) GS1/RSS	Convert type to GS1
			2.) UCC-128	Convert type to UCC-128
			3.) None	No type emulation
	TCIF 39	TCIF 39	Enabled/Disabled	Enable/Disable decoding of TCIF Linked Code 39 symbols
	QR Code	QR Code	Enabled/Disabled	Enable/Disable decoding of QR Code symbols
		Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 3500 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 3500 characters	
	Data Matrix	Data Matrix	Enabled/Disabled	Enable/Disable decoding of Data Matrix symbols
		Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 1500 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 1500 characters	
	MaxiCode	MaxiCode	Enabled/Disabled	Enable/Disable decoding of Maxi-Code symbols
		Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 150 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 150 characters	
	Aztec	Aztec	Enabled/Disabled	Enable/Disable decoding of Aztec symbols
		Min Length	Min: 0 characters	Minimum length in characters to allow a good read
			Max: 3750 characters	
		Max Length	Min: 0 characters	Maximum length in characters to allow a good read
			Max: 3750 characters	
		Aztec Runes	Enabled/Disabled	Enable/Disable decoding of Aztec runes symbols

2-Dimensional Imager Symbology Settings - cont'd.

Type	Setting Parameter	Available Options	Option Description
OCR	OCR Font	1.) Disabled	Disable OCR
		2.) OCR-A	Enable OCR templates with OCR-A font
		3.) OCR-B	Enable OCR templates with OCR-B Font
		4.) Currency	Enable OCR font used on U.S. Currency
		5.) MICR	Enable MICR E-13B font used on bank checks
		6.) SEMI	Enable SEMI font used in the semiconductor industry

Networking Options

Setting Parameter	Available Options	Option Description
Configure IP	1.) Static	Use manual settings for IP address, subnet mask, default gateway, and DNS server
	2.) DHCP	Use automatic (broadcast DHCP request) settings
IP Address	Enter IPv4 Address	Static IP address that the M7220 should use for the 802.11b/g radio
Subnet	Enter IPv4 Address Mask	Subnetwork mask that the M7220 should use for the 802.11b/g radio
Gateway	Enter IPv4 Address	Default gateway for network connections
DNS	Enter IPv4 Address	DNS server address to use for name resolution
SSID	Enter Text	802.11 wireless network name (SSID / ESSID) to connect to
Mode	1.) 802.11b	Only use 802.11b data rates
	2.) 802.11b/g	Use 802.11b/g mixed mode with auto-fallback
Network	1.) Infrastructure	802.11 network is infrastructure mode with standard 802.11 access points (APs)
	2.) Ad-hoc	Connect to network in Ad-hoc (Peer-to-Peer) mode without APs

Networking Options - cont'd.

Setting Parameter	Available Options	Option Description
Roam Thshld	Min: -80 dBm Max: -60 dBm	Threshold level in absolute dBm that the M7220 802.11b/g radio should not allow roaming if above (-80 dBm is approximately 5% Signal Level, -60 dBm is approximately 80% Signal Level)
Rescan Time	Min: 5 seconds Max: 60 seconds	When the M7220 Signal Level is below the Roam Threshold, Rescan Time is the amount of time between scans while searching for better APs
Channel	Min: 1 Max: 11 (US) 13 (EU)	Channel to use for 802.11 network connection in Ad-hoc / Peer-to-Peer mode
Encryption	1.) None	No encryption or authorization is used (NOT RECOMMENDED)
	2.) WEP 40 (64)	40 bit WEP (commonly called 64 bit) encryption
	2.) WEP 104 (128)	104 bit WEP (commonly called 128 bit) encryption
	3.) WPA / WPA2	WPA or WPA2 encryption and authorization (auto-negotiating between WPA and WPA2 on association)
WPA Type	1.) PSK	Pre-Shared Key
	2.) EAP-PEAP	Protected Extensible Authentication Protocol
	3.) EAP-TLS	EAP Transport Layer Security (NOTE: requires valid certificate files placed in /mnt/certs)
	4.) EAP-TTLS	Tunneled Transport Layer Security
Keys/Phrases	1.) Hex Encoded	Keys and passphrases should be interpreted as a hexadecimal encoded string
	2.) ASCII Phrases	Keys and passphrases should be interpreted as normal ASCII text
WPA Identity	(Text Entry)	Username / Identity to use for WPA/WPA2 Authorization
Passkey	(Text Entry)	Passkey to use as the WPA/WPA2 Password, Passphrase, or Pre-Shared key
Tx WEP Key	1.) 1	Use WEP Key 1 (IEEE key 0)
	2.) 2	Use WEP Key 2 (IEEE key 1)
	3.) 3	Use WEP Key 3 (IEEE key 2)
	4.) 4	Use WEP Key 4 (IEEE key 3)
WEP Key 1	(Text Entry)	WEP Key 1 (IEEE key 0)
WEP Key 2	(Text Entry)	WEP Key 2 (IEEE key 1)
WEP Key 3	(Text Entry)	WEP Key 3 (IEEE key 2)
WEP Key 4	(Text Entry)	WEP Key 4 (IEEE key 3)

Port Options

Setting Parameter	Available Options	Option Description
USB	1.) Disabled	Disable the USB Slave port
	2.) Console	Enable a standard Linux console (getty) on the USB port via CDC-ACM
	3.) Data Uplink	Use the USB port as the Data Uplink port to transfer settings files to and from a PC
Serial	1.) Disabled	Disable the RS-232 serial port
	2.) Printer	Use the RS-232 serial port as the printing port
	3.) Console	Enable a standard Linux console (getty) on the RS-232 serial port
	4.) Data Uplink	Use the RS-232 serial port as the Data Uplink port to transfer settings files to and from a PC
Baud	1.) 300	Set the Baud rate for the M7220's RS-232 serial port
	2.) 1200	
	3.) 9600	
	4.) 19200	
	5.) 38400	
	6.) 57600	
	7.) 115200	
Parity	1.) None	Set the Parity for the M7220's RS-232 serial port
	2.) Even	
	3.) Odd	
Data Bits	1.) 7	Set the number of data bits in the serial packet for the RS-232 serial port
	2.) 8	
Stop Bits	1.) 1	Set the number of stop bits in the serial packet for the RS-232 serial port
	2.) 2	

Local Security Settings

Setting Parameter	Available Options	Option Description
Pwd on Boot	Enabled/Disabled	Require a secret password to power up the M7220
Boot Pwd	(Text Entry)	Power up password
Pwd on Setup	Enabled/Disabled	Require a secret password to modify any item under the "Administration" menu **If set this password will also be used to gain access to the embedded web site if the HTTP server is enabled in Startup Options
Setup Pwd	(Text Entry)	"Administration" menu password

Power Management Settings

Setting Parameter	Available Options	Option Description
Sleep Timer	Min: 0 minutes Max: 60 minutes	Set the inactive sleep timer, the M7220 will go into a low power suspend mode if no key is pressed on the keyboard within this about of time. (To disable the Sleep Timer, set to 0)
Radio	1.) Stay On	When in suspend mode, leave the 802.11b/g radio on
	2.) Sleep	Power off the 802.11b/g radio during suspend
Ports	1.) Stay On	When in suspend mode, leave the external ports (USB, RS-232) active
	2.) Sleep	Power off the external ports during suspend
Off Timer	Min: 0 minutes Max: 60 minutes	Amount of time to wait after suspend before powering off the M7220 completely (To disable the Off Timer, set to 0)
BL Timer	Min: 0 minutes Max: 20 minutes	Amount of time to leave the backlight on once enabled
BL on Boot	Enabled/Disabled	Turn on the backlight during system boot

Keyboard Settings

Setting Parameter	Available Options	Option Description
Custom Fkeys	Enabled/Disabled	Enable/Disable the use of system-wide custom function keys; These keys are mapped into the Linux kernel (following 'loadkeys' conventions) and will affect the system globally. Non-printable characters can be defined in standard octal convention (i.e. 'Escape' = '\033')
F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17, F18, F19, F20, F21, F22, F23, F24	(Text Entry)	Custom function key strings

Host / Terminal Setup

Section	Setting Parameter	Available Options	Option Description
Host Server 1, Host Server 2, Host Server 3, Host Server 4, Host Server 5, Host Server 6, Host Server 7, Host Server 8	Terminal	1.) Disabled	Disable the host connection and do not show it in the "Connect / Reconnect" menu
		2.) VT100	Enable this connection as VT100
		3.) VT220	Enable this connection as VT220
		4.) TN5250	Enable this connection as TN5250
		5.) Browser	Enable this connection as a Web Browser
		6.) Custom 1	Enable this connection as a custom Linux command
		7.) Custom 2	Enable this connection as a custom Linux command
	Name	(Text Entry)	The name of the connection to display in the "Connect / Reconnect" menu
	Host Address	(Text Entry) / (IPv4 Address)	The IPv4 server address or the URL of the server
	Host Port	(Text Entry)	The TCP port to connect to
	Terminal ID	(Text Entry)	The identification string that should be sent to the server upon connection (common Terminal IDs match the terminal type: VT100 connections often use "vt100" for the Terminal ID)

Host / Terminal Setup - cont'd.

Section	Setting Parameter	Available Options	Option Description
Host Server 1, Host Server 2, Host Server 3, Host Server 4, Host Server 5, Host Server 6, Host Server 7, Host Server 8	ENQ Answerback	(Text Entry)	The reply that the M7220 should use when receiving an ENQ from the server. **See Table "VTxxx ENQ Answerback Macros" for advanced usage
	VT Search 1 VT Reply 1 VT Search 2 VT Reply 2 VT Search 3 VT Reply 3	(Text Entry)	Search strings used to automate login or commands in VTxxx connections. The M7220 VTxxx application will search for the "Search" strings and reply with the corresponding "Reply" string when found.
VTxxx (VT100/VT220)	Local Echo	Enabled/Disabled	Enable/Disable echoing of input data sent to host server
	Screen Size	1.) 26x40	Use smallest font possible for largest screen area (26 rows x 40 columns)
		2.) 16x26	Use small font (16 rows x 26 columns)
		3.) 16x21	Use "Legacy" font (16 rows x 26 columns)
		4.) 20x20	Use standard medium font (20 rows x 20 columns)
		5.) 10x20	Use large font (10 rows x 20 columns)
		6.) 7x13	Use huge font (7 rows x 13 columns)
	Virtual 24x80	Enabled/Disabled	Enable/Disable virtual standard terminal screen size of 24 rows x 80 columns
	View Scrolling	Enabled/Disabled	Enable/Disable scrolling (panning the screen's view) when using Virtual 24x80
	Follow Cursor	Enabled/Disabled	Enable/Disable automatically panning/scrolling the screen to keep cursor in view
	Column Shift	Min: 0 columns	Number of columns to pan left and right when manually scrolling the view
		Max: 20 columns	
	Row Shift	Min: 0 rows	Number of rows to pan up and down when manually scrolling the view
		Max: 20 rows	
	Wrap Lines	Enabled/Disabled	Wrap long strings of characters to the next line on the screen automatically
	Linefeeds	1.) As Received	Do not translate Linefeeds
		2.) Add CR Prefix	Translate linefeeds to carriage return + linefeed
	ANSI Colors	Enabled/Disabled	Attempt to translate ANSI colors into grayscale equivalents

Host / Terminal Setup - cont'd.

Section	Setting Parameter	Available Options	Option Description
VTxxx (VT100/VT220)	Escape Parsing	1.) Normal	Normal Escape
		2.) As `	Parse ` as an Escape
	Bksp & Del	1.) Normal	Normal use of Backspace and Delete
		2.) Swap	Swap functionality (Backspace key emits a Delete)
	Null Padding	Enabled/Disabled	Enable/Disable normal NULL padding in VTxxx emulation (some Microsoft Windows based servers do not handle padding correctly)
	Auto-Reconnect	Enabled/Disabled	Automatically reconnect to the host server upon closure of the VT Session
TN5250 Settings	Screen Size	1.) 26x40	Use smallest font possible for largest screen area (26 rows x 40 columns)
		2.) 16x26	Use small font (16 rows x 26 columns)
		3.) 16x21	Use "Legacy" font (16 rows x 26 columns)
		4.) 20x20	Use standard medium font (20 rows x 20 columns)
		5.) 10x20	Use large font (10 rows x 20 columns
		6.) 7x13	Use huge font (7 rows x 13 columns)
	View Scrolling	Enabled/Disabled	Enable/Disable scrolling (panning the screen's view) ; if disabled, the screen will be locked in the Start Row and Start Column
	Fieldlock Cursor	Enabled/Disabled	Enable/Disable forcing the cursor to always be located in a field
	Follow Cursor	Enabled/Disabled	Enable/Disable automatically panning/scrolling the screen to keep cursor in view
	Column Shift	Min: 0 columns	Number of columns to pan left and right when manually scrolling the view
		Max: 20 columns	
	Row Shift	Min: 0 rows	Number of rows to pan up and down when manually scrolling the view
		Max: 20 rows	
	Start Column	Min: 1	Column location to put the upper left corner of the initially viewed portion of the screen
		Max: 24	
	Start Row	Min: 1	Row location to put the upper left corner of the initially viewed portion of the screen
		Max: 80	
	Bksp & Del	1.) Normal	Normal use of Backspace and Delete
		2.) Swap	Swap functionality (Backspace key emits a Delete)

Host / Terminal Setup - cont'd.

Section	Setting Parameter	Available Options	Option Description
TN5250 Settings	RESET on Error	1.) Manual	The user must manually reset an error condition
		2.) Automatic	The Software will automatically send a RESET to the server after displaying the error message for the amount of time specified in RESET Delay
	RESET Delay	Min: 3 seconds	The amount of time to display an error message until automatically sending a RESET to the server
		Max: 10 seconds	
	Long Bar codes	1.) Allow	Allow long bar codes to automatically move to the next input field
		2.) Truncate	Truncate long bar codes to fit in the current input field
Web Browser	Display Mode	1.) Text	Use the Web Browser in text only mode
		2.) Graphics	Use the Web Browser in graphical mode
Custom 1	Command	(Text Entry)	Linux command to run when selected in the "Connect / Reconnect" menu
	Pass IP as Param	Enabled/Disabled	Enable/Disable passing the Host Server's IP address (as set up in the Host Server menu) to the Linux command as a normal parameter
Custom 2	Command	(Text Entry)	Linux command to run when selected in the "Connect / Reconnect" menu
	Pass IP as Param	Enabled/Disabled	Enable/Disable passing the Host Server's IP address (as set up in the Host Server menu) to the Linux command as a normal parameter

General Settings

Section	Available Options	Option Description
Auto-Connect	Enabled/Disabled	Automatically connect to a host on boot
Auto-Delay	Min: 0 seconds	Delay connection to allow network startup
	Max: 60 seconds	
Auto-Host	(Host List)	Connect to selected host on boot
Out of Range	1.) No Warning	Give no warning upon moving out of range of current AP
	2.) Audio Warning	Sound a beep upon moving out of range of current AP
	3.) Visual Warning	Display a visual warning upon moving out of range of current AP

VTxxx ENQ Answerback Macros

Section	Setting Parameter
\1	First octet of unit's IP address
\2	Second octet of unit's IP Address
\3	Third octet of unit's IP Address
\4	Fourth octet of unit's IP Address
\\	Back slash character
\a	First hex encoded byte of unit's MAC address
\b	Second hex encoded byte of unit's MAC address
\c	Third hex encoded byte of unit's MAC address
\d	Fourth hex encoded byte of unit's MAC address
\e	Fifth hex encoded byte of unit's MAC address
\f	Sixth hex encoded byte of unit's MAC address
\S	Unit's serial number

Audio Setup

Setting Parameter	Available Options	Option Description
System Sound	Enabled/Disabled	Enable/Disable the global system sound
Key Ticks	1.) Disabled	Do not emit a beep/tick on keyboard entry
	2.) Short	Emit a high-pitched, short tick on a keyboard button press
	3.) Long	Emit a lower-pitched, longer tick on a keyboard button press

Startup Options

Setting Parameter	Available Options	Option Description
TELNET Srvr	Enabled/Disabled	Enable the embedded TELNET server on boot ** Usr: root, ** Pwd: aml
SSH Server	Enabled/Disabled	Enable the embedded SSH / SFTP server on boot ** Usr: root, ** Pwd: aml
FTP Server	Enabled/Disabled	Enable the FTP server on boot ** Usr: root, ** Pwd: aml
HTTP Server	Enabled/Disabled	Enabled the embedded Web server on boot If the "Setup Password" is set, it will be used as the password to log in to the embedded web server. Otherwise, the password defaults to "aml"
Barcode Mon	Enabled/Disabled	Enable the standard bar code scanner monitoring service Unless developing custom applications for the M7220, this should be enabled

M7220 Diagnostic Menu

The M7220 Diagnostic menu contains helpful tools in debugging network problems and general system issues.

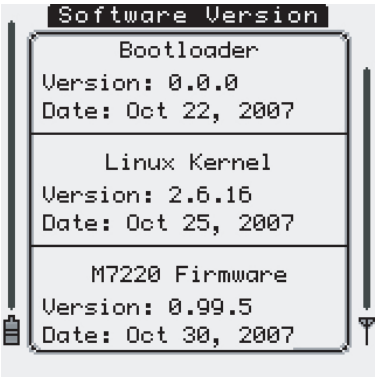
1) System Information

The M7220 System Information screen shows data about the hand-held computer's hardware, including the CPU clock speed, installed scan engine, keyboard type, and the unit's serial number.

Scan Engine ID String Definitions

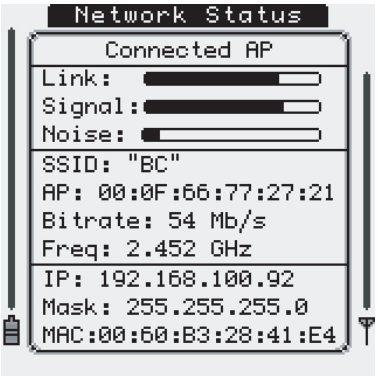
ID String	Scan Engine
2DI	2-Dimensional Imager
LAS	High Speed Standard Laser
XLAS	Standard Laser
LR	Long Ranger Laser
ALR	Advanced Long Ranger Laser
???	Unknown / Detection Error

2) Software Information



The M7220 Software Information screen displays the current firmware versions installed on the device.

3) Network Status



The Network Status screen displays a large amount of data about the current network connection.

Network Status Screen Information

Setting Parameter	Available Options	Option Description
Link	802.11b/g Link Quality	Link quality is a relative value derived from signal level, noise floor, packet loss, and other values. It is a fair approximation of how well established the link is.
Signal	802.11b/g Receive Signal Level	Signal level is a percentage value derived from the received signal strength absolute value. It displays how much of the received signal is usable to transfer data. As the signal level lowers, the 802.11b/g data rate will also lower.
Noise	802.11b/g Noise Level	The Noise level displays how interference or noise is on the current channel. As the noise level increases, less and less of the signal can be used to transfer data.

Network Status Screen Information

Setting Parameter	Available Options	Option Description
SSID	Network SSID	The Service Set Identifier (SSID) is the name of the current wireless network.
AP	Current BSSID	The Basic Service Set Identifier (BSSID) is the MAC address of the current Access Point.
Bitrate	802.11b/g Data Rate	The bit rate of the current association. As the signal degrades in quality, the bit rate will automatically be lowered to help retain the connection. *See the 802.11b/g Data Rates table below for information on the rates that are used.
Freq	Current 802.11b/g Frequency	The current frequency of the network association *See the 802.11 Channel / Frequency table below for conversion to 802.11 channel number
IP	Network IP Address of unit	The IPv4 Network Address of the unit's radio
Mask	Subnetwork Mask	The IPv4 Subnetwork Mask of the unit's radio
MAC	Hardware MAC Address	The Hardware MAC address of the unit's radio

802.11b/g Data Rates and Theoretical Ranges

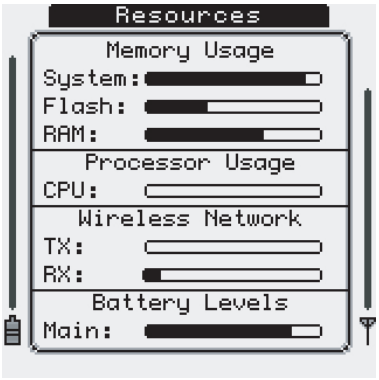
Mode	Signaling Data Rates (Mbit/s)	Maximum Throughput (Typ) at Maximum Signaling Rate	Max Range at Minimum Data Rate (Radius Indoor)	Max Range at Minimum Data Rate (Radius Outdoor)
802.11b	1, 2, 5.5, 11	4.3 Mbit/s	~38 Meters	~140 Meters
802.11b/g	1, 2, 5.5, 6, 9, 11, 12, 18, 22, 24, 36, 48, 54	19 Mbit/s	~38 Meters	~140 Meters

802.11 Channel / Frequency

802.11b/g Channel	Center Frequency
1	2.412 GHz
2	2.417 GHz
3	2.422 GHz
4	2.427 GHz
5	2.432 GHz
6	2.437 GHz
7	2.442 GHz
8	2.447 GHz
9	2.452 GHz
10	2.457 GHz
11	2.462 GHz
12*	2.467 GHz*
13*	2.472 GHz*

* Denotes available in EU only

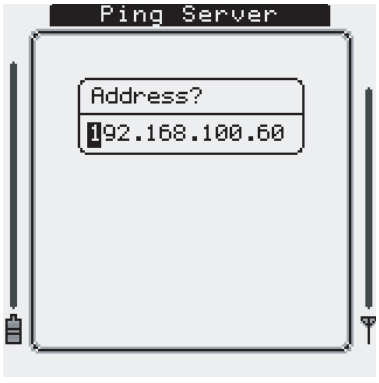
4) Resource Usage

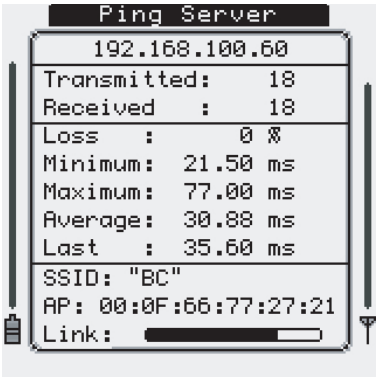


The current usage of its available hardware resources can be viewed in the Usage screen.

Section	Label	Description
Memory Usage	System	The current amount of the Linux file system that is in use. (Volatile)
	Flash	The current amount of the 4MiB /mnt flash partition that is in use. (Non-volatile)
	RAM	The current amount of system RAM that is in use by running applications.
Processor Usage	CPU	The current processor usage.
Wireless Network	TX	The current data throughput through the 802.11b/g radio over time.
	RX	
Battery Levels	Main	The current approximate battery level percentage.

5) Ping Server

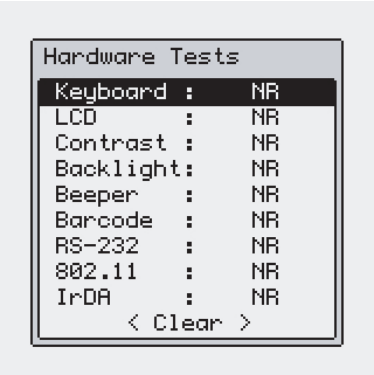




The Ping Server function allows testing of the current wireless network connection.

Label	Description
Transmitted	The number of packets that have been transmitted to the server
Received	The number of responses from the server
Loss	The percentage of missed responses over total packets transmitted
Minimum	The shortest amount of time detected between a transmission and a response
Maximum	The longest amount of time detected between a transmission and a response
Average	The average amount of time between a transmission and a response from the server
Last	The amount of time between the most recent transmission and response.

6) Hardware Tests



THE M7220 HARDWARE TESTS ARE FOR INTERNAL USAGE BY THE AMERICAN MICROSYSTEMS, LTD STAFF. FOR THE TESTS TO PASS CORRECTLY, THE UNIT MUST BE SETUP IN A SPECIFIC WAY ON A SPECIFIC DEBUGGING NETWORK AND WITH SPECIFIC DEBUGGING TOOLS. MOST OF THESE TESTS WILL FAIL ON ANY OTHER SETUP.

7) Bar Code Data Viewer

See the Tools & Utilities section for more information

SSH Client Setup

The M7220 software contains the OpenSSH suite of SSH networking tools.

The currently installed version is: OpenSSH_3.9p1, OpenSSL 0.9.7e.

Setting up a Connection with the SSH Client

To set up a new connection using the SSH client:

1.) From the Administration menu, select the Terminal icon (option 7).
2.) Select one of the Custom icons (options 8 or 9)
3.) Enter the following into the Command text option without the quotes:

'/usr/bin/ssh <hostaddress>'

where <hostaddress> is the IP address of the server to connect to.

If using a standard login with the SSH shell, use the following for the Command:

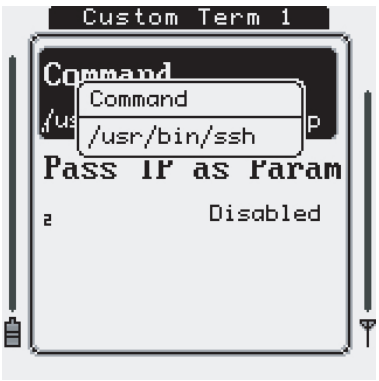
'/usr/bin/ssh -l<myusername> <hostaddress>'

where <myusername> is the username to use when authenticating and <hostaddress> is the IP address of the server to connect to. The user will be prompted to enter the password during login.

If the server is using a non-standard TCP port to listen for SSH connections (i.e. not TCP port 22), add the following to the command strings:

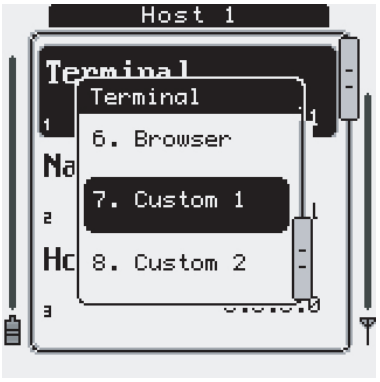
'-p <port>'

where <port> is the port number to use.



SSH Client Setup - cont'd.

4.) Make sure that Pass IP as Param option is Disabled.
5.) Press [Menu] or [Esc] to return to the Terminal Setup Menu.
6.) Enter the Host List menu by selecting the Hosts icon (option one).
7.) Select an available host connection by using the arrow keys and pressing [ENTER]
8.) Set the Terminal application option to either Custom 1 or Custom 2 depending on the selected Custom item selected in step 2.



9.) Enter a Name for the new connection in the Name option.

10.) [Esc] four times to return to the Connect menu and select the newly create connection

SSH Client Setup - cont'd.

Generating Unique Encryption Keys and Using SSH Passphrases

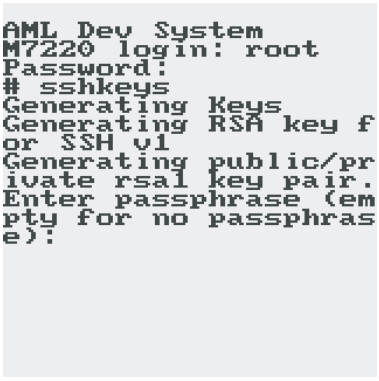
To allow easy setup of the SSH tools, the M7220 contains a script to help automate the key generation: '/bin/sshkeys'.

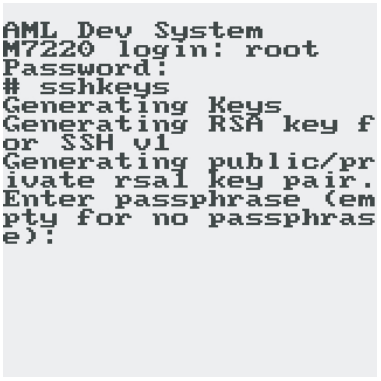
1.) From the Tools & Utilities menu, select the Prompt icon (option six) to switch to the Linux shell.

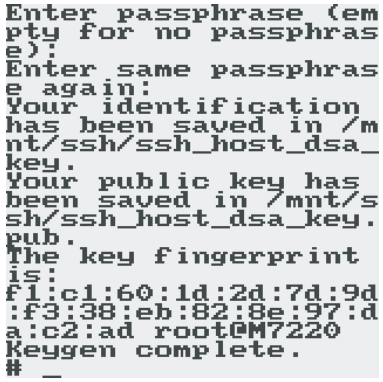
2.) Login to the shell with username 'root' and password 'aml'.

SSH Client Setup - cont'd.

3.) Type 'sshkeys' and press [ENTER]. The public/private key pairs will be generated, a process that may take up to five minutes. Throughout the generation, the user will be prompted to enter passphrases for the key generation. These passphrases would be supplied by a system administrator of the server that the unit will be connecting to, or, if they are not used, the user can simply hit [ENTER] to randomly generate the phrase.







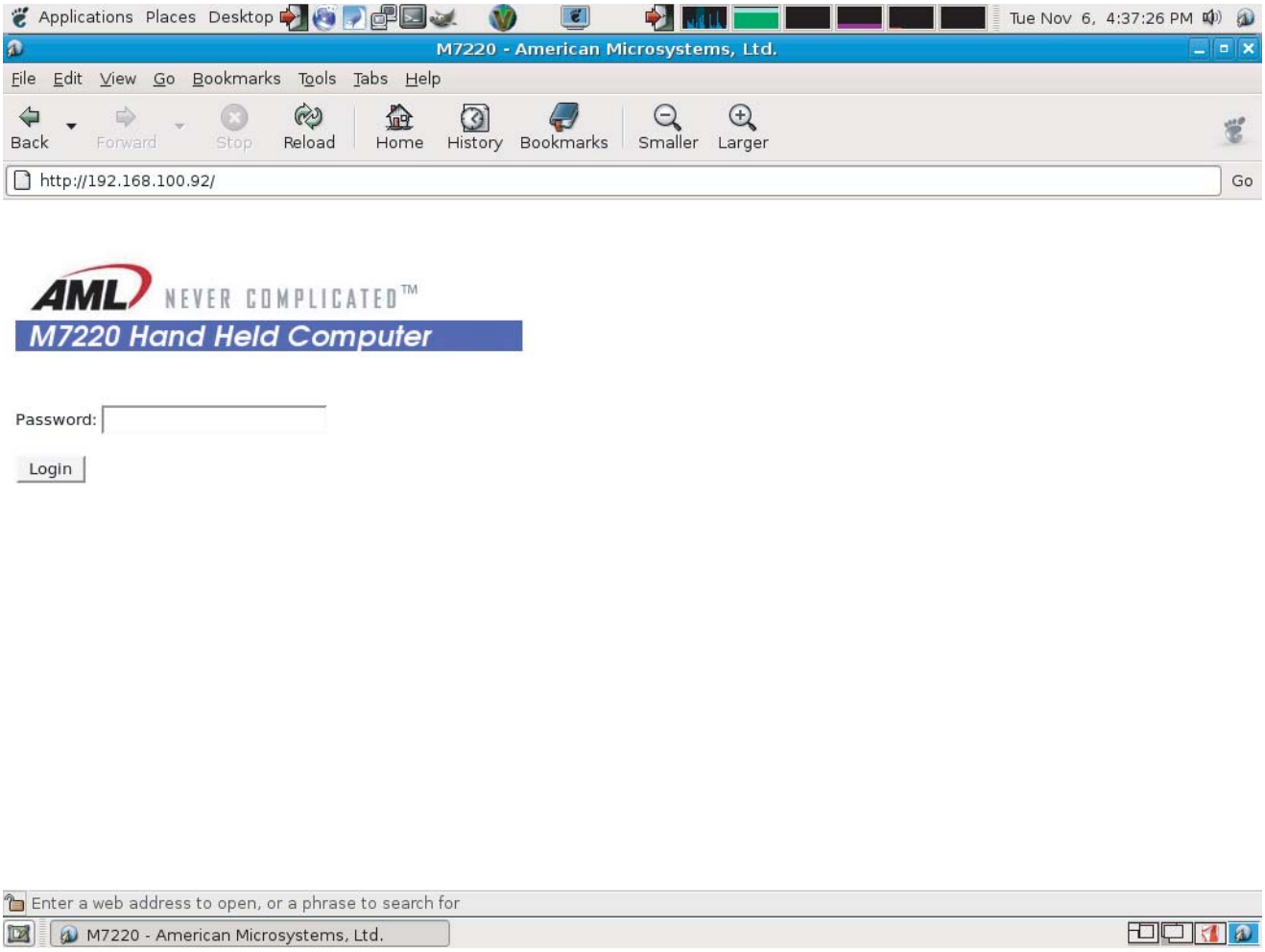
4.) Once the generation of the SSH keys is complete, reboot the M7220.

**NOTE: The sshkeys script can also be run from a SSH or TELNET session connected to the device, or from the Linux console running on the RS-232 port, if enabled.*

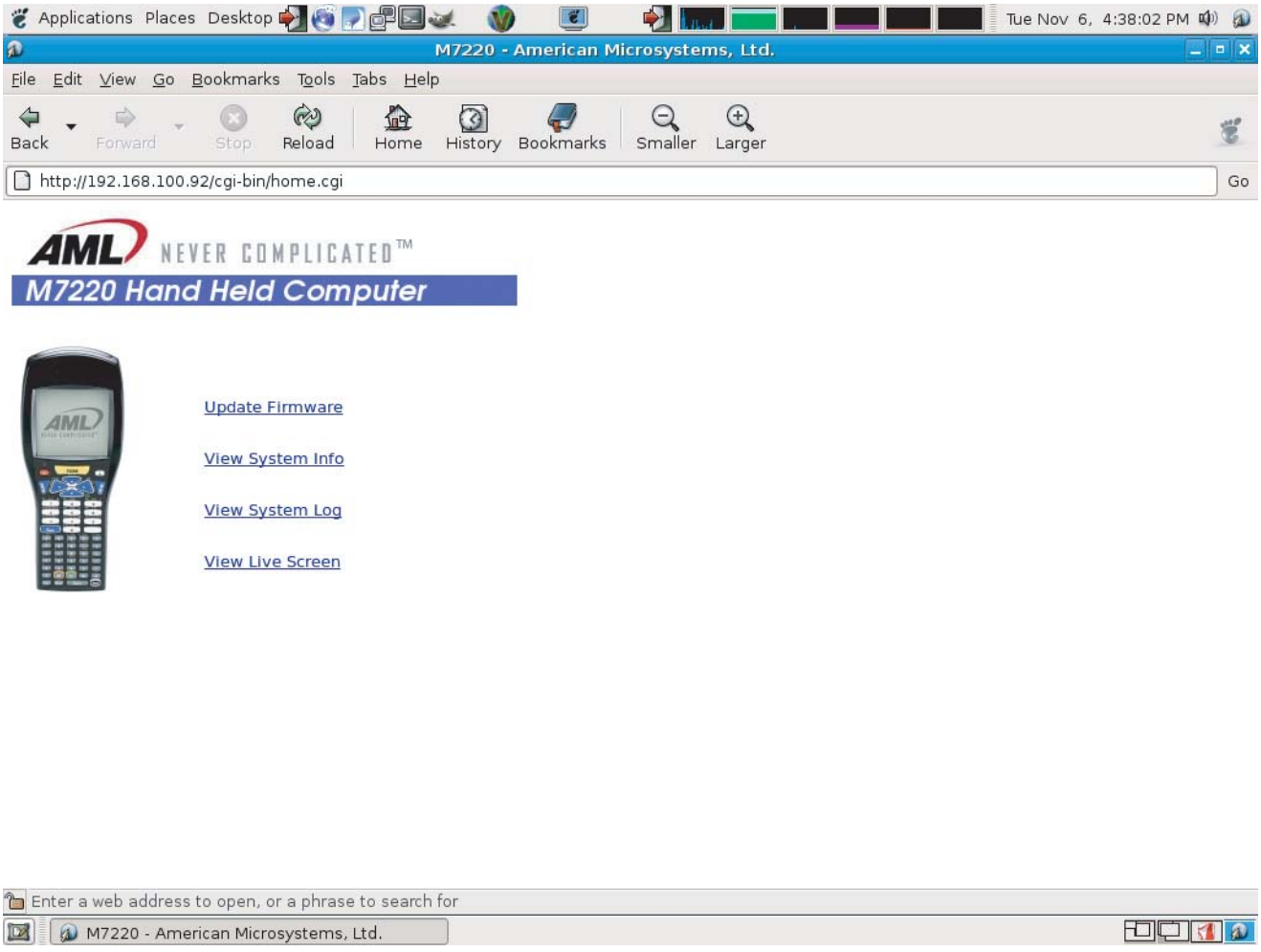
Chapter 3

M7220 Embedded Website

The M7220 contains a very powerful diagnostic and system management tool built in to every unit through the embedded HTTP web server. Simply enter the units IP address into any web browser on a PC residing on the same network as the M7220 to access the web server.


Applications Places Desktop
Tue Nov 6, 4:37:26 PM
M7220 - American Microsystems, Ltd.
File Edit View Go Bookmarks Tools Tabs Help
Back Forward Stop Reload Home History Bookmarks Smaller Larger
http://192.168.100.92/
Go
AML NEVER COMPLICATED™
M7220 Hand Held Computer
Password:
Login
Enter a web address to open, or a phrase to search for
M7220 - American Microsystems, Ltd.

To access the embedded website, a password must be entered. This password will match the Administration Settings Password if set, or will default to 'aml'.


Applications Places Desktop
Tue Nov 6, 4:38:02 PM
M7220 - American Microsystems, Ltd.
File Edit View Go Bookmarks Tools Tabs Help
Back Forward Stop Reload Home History Bookmarks Smaller Larger
http://192.168.100.92/cgi-bin/home.cgi
Go
AML NEVER COMPLICATED™
M7220 Hand Held Computer
Update Firmware
View System Info
View System Log
View Live Screen
Enter a web address to open, or a phrase to search for
M7220 - American Microsystems, Ltd.

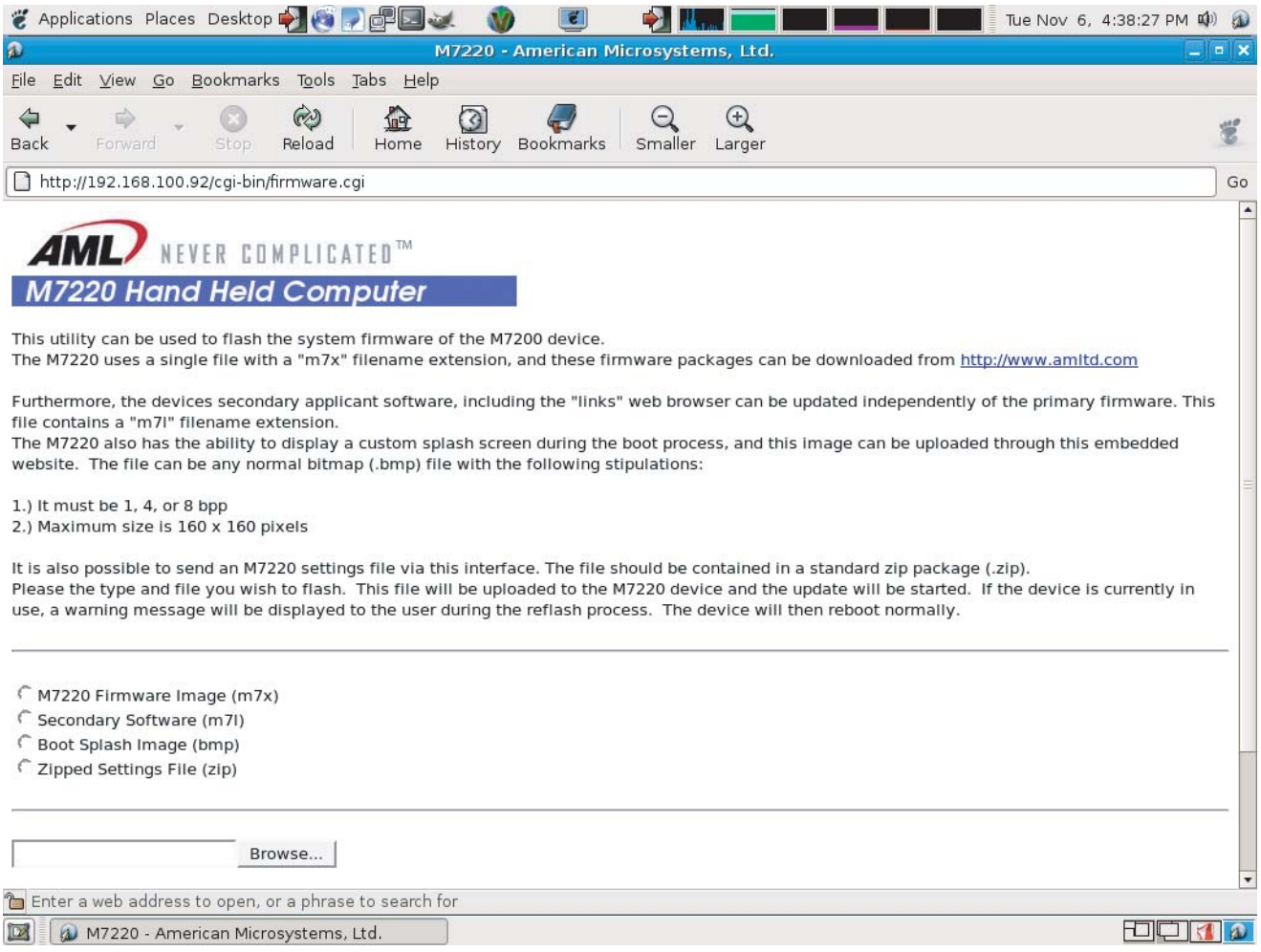
Once access has been granted, the web server will give 4 options:

1) Update Firmware

The primary M7220 firmware can be uploaded to the device via this interface. M7220 firmware images can be downloaded from http://www.amltd.com.

Furthermore, the boot splash image can be modified through this interface. A 1, 2, or 4 bit/pixel bitmap image, no larger than 160x160 can be uploaded and will be shown to the user during the initial boot-strap of the device.

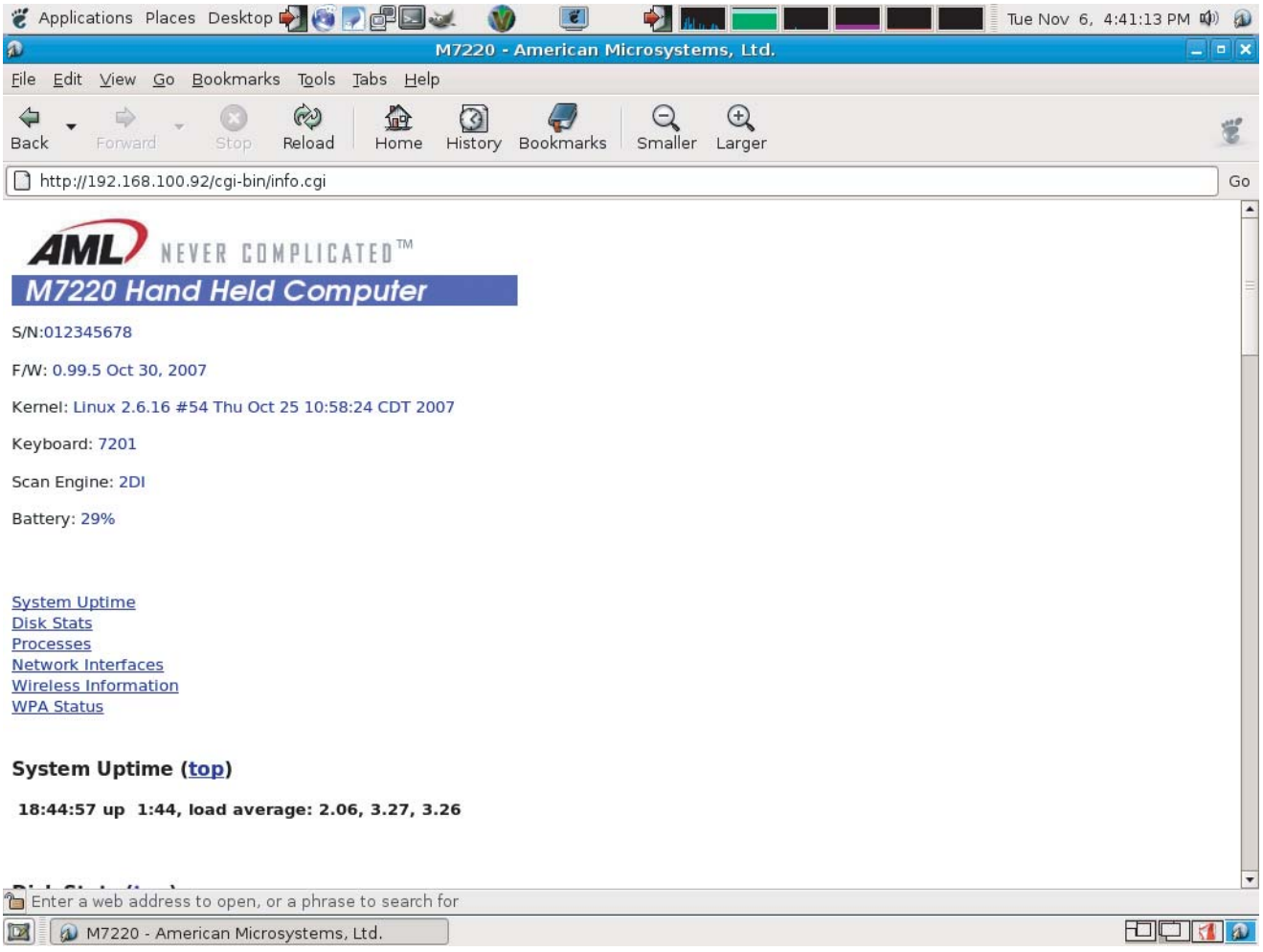
Optional software packages can also be installed through the embedded website, along with M7220 settings files.


Applications Places Desktop
Tue Nov 6, 4:38:27 PM
M7220 - American Microsystems, Ltd.
File Edit View Go Bookmarks Tools Tabs Help
Back Forward Stop Reload Home History Bookmarks Smaller Larger
http://192.168.100.92/cgi-bin/firmware.cgi
Go
AML NEVER COMPLICATED™
M7220 Hand Held Computer
This utility can be used to flash the system firmware of the M7200 device.
The M7220 uses a single file with a "m7x" filename extension, and these firmware packages can be downloaded from http://www.amltd.com
Furthermore, the devices secondary applicant software, including the "links" web browser can be updated independently of the primary firmware. This file contains a "m7l" filename extension.
The M7220 also has the ability to display a custom splash screen during the boot process, and this image can be uploaded through this embedded website. The file can be any normal bitmap (.bmp) file with the following stipulations:
1.) It must be 1, 4, or 8 bpp
2.) Maximum size is 160 x 160 pixels
It is also possible to send an M7220 settings file via this interface. The file should be contained in a standard zip package (.zip).
Please the type and file you wish to flash. This file will be uploaded to the M7220 device and the update will be started. If the device is currently in use, a warning message will be displayed to the user during the reflash process. The device will then reboot normally.
M7220 Firmware Image (m7x)
Secondary Software (m7l)
Boot Splash Image (bmp)
Zipped Settings File (zip)
Browse...
Enter a web address to open, or a phrase to search for
M7220 - American Microsystems, Ltd.

2) View System Info

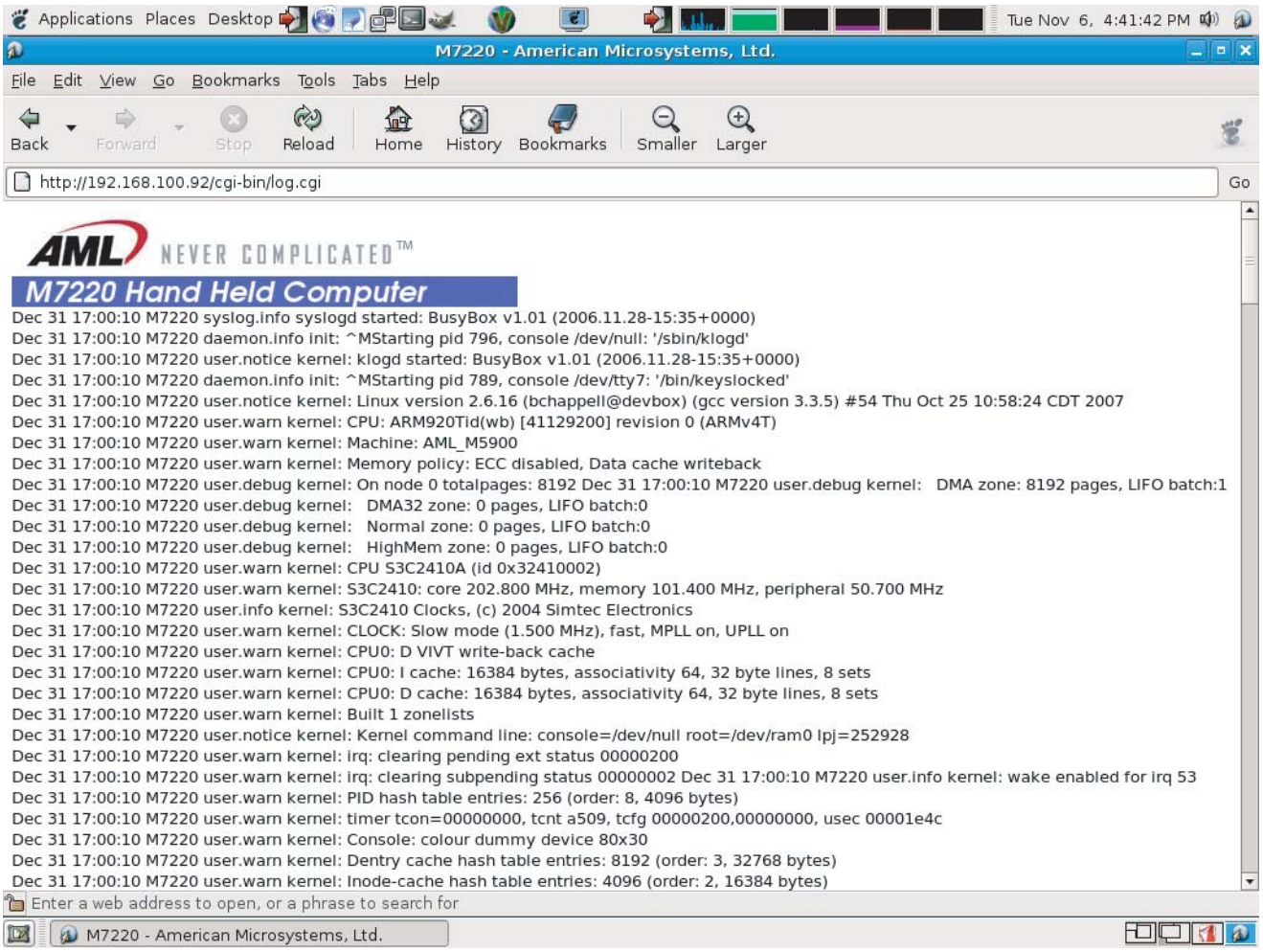
The View System Info link will display a multitude of data about the M7220. Among other things, it will display the following:

Serial Number
Firmware Version
Keyboard Type
Scan Engine Type
Battery Level
System Uptime (Time since the unit was last powered off)
Memory and Flash usage
Currently running applications
Network Status including:
- Current AP
- Current SSID
- Current Bitrate
- Current Channel / Frequency
- NO ENCRYPTION KEYS OR PASSWORDS ARE DISPLAYED FOR SECURITY REASONS


Applications Places Desktop
Tue Nov 6, 4:41:13 PM
M7220 - American Microsystems, Ltd.
File Edit View Go Bookmarks Tools Tabs Help
Back Forward Stop Reload Home History Bookmarks Smaller Larger
http://192.168.100.92/cgi-bin/info.cgi
Go
AML NEVER COMPLICATED™
M7220 Hand Held Computer
S/N:012345678
F/W: 0.99.5 Oct 30, 2007
Kernel: Linux 2.6.16 #54 Thu Oct 25 10:58:24 CDT 2007
Keyboard: 7201
Scan Engine: 2DI
Battery: 29%
System Uptime
Disk Stats
Processes
Network Interfaces
Wireless Information
WPA Status
System Uptime (top)
18:44:57 up 1:44, load average: 2.06, 3.27, 3.26
Enter a web address to open, or a phrase to search for
M7220 - American Microsystems, Ltd.

3) View System Log

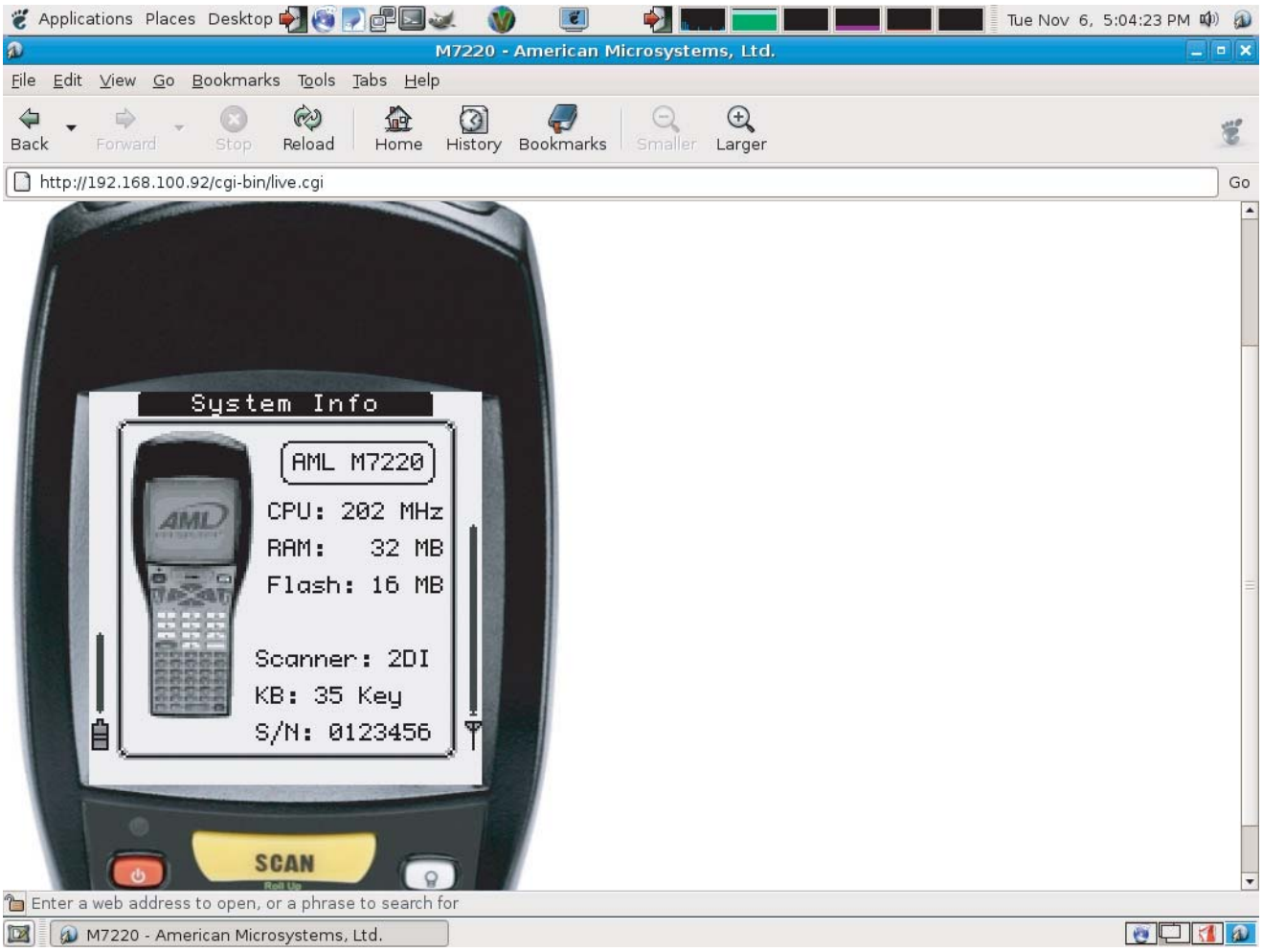
The standard Linux system log file (/var/log/messages) is viewable through this option.


Applications Places Desktop
Tue Nov 6, 4:41:42 PM
M7220 - American Microsystems, Ltd.
File Edit View Go Bookmarks Tools Tabs Help
Back Forward Stop Reload Home History Bookmarks Smaller Larger
http://192.168.100.92/cgi-bin/log.cgi
Go
AML NEVER COMPLICATED™
M7220 Hand Held Computer
Dec 31 17:00:10 M7220 syslog.info syslogd started: BusyBox v1.01 (2006.11.28-15:35+0000)
Dec 31 17:00:10 M7220 daemon.info init: ^MStarting pid 796, console /dev/null: '/sbin/klogd'
Dec 31 17:00:10 M7220 user.notice kernel: klogd started: BusyBox v1.01 (2006.11.28-15:35+0000)
Dec 31 17:00:10 M7220 daemon.info init: ^MStarting pid 789, console /dev/tty7: '/bin/keyslocked'
Dec 31 17:00:10 M7220 user.notice kernel: Linux version 2.6.16 (bchappell@devbox) (gcc version 3.3.5) #54 Thu Oct 25 10:58:24 CDT 2007
Dec 31 17:00:10 M7220 user.warn kernel: CPU: ARM920Tid(wb) [41129200] revision 0 (ARMv4T)
Dec 31 17:00:10 M7220 user.warn kernel: Machine: AML_M5900
Dec 31 17:00:10 M7220 user.warn kernel: Memory policy: ECC disabled, Data cache writeback
Dec 31 17:00:10 M7220 user.debug kernel: On node 0 totalpages: 8192 Dec 31 17:00:10 M7220 user.debug kernel: DMA zone: 8192 pages, LIFO batch:1
Dec 31 17:00:10 M7220 user.debug kernel: DMA32 zone: 0 pages, LIFO batch:0
Dec 31 17:00:10 M7220 user.debug kernel: Normal zone: 0 pages, LIFO batch:0
Dec 31 17:00:10 M7220 user.debug kernel: HighMem zone: 0 pages, LIFO batch:0
Dec 31 17:00:10 M7220 user.warn kernel: CPU S3C2410A (id 0x32410002)
Dec 31 17:00:10 M7220 user.warn kernel: S3C2410: core 202.800 MHz, memory 101.400 MHz, peripheral 50.700 MHz
Dec 31 17:00:10 M7220 user.info kernel: S3C2410 Clocks, (c) 2004 Simtec Electronics
Dec 31 17:00:10 M7220 user.warn kernel: CLOCK: Slow mode (1.500 MHz), fast, MPLL on, UPLL on
Dec 31 17:00:10 M7220 user.warn kernel: CPU0: D VIVT write-back cache
Dec 31 17:00:10 M7220 user.warn kernel: CPU0: I cache: 16384 bytes, associativity 64, 32 byte lines, 8 sets
Dec 31 17:00:10 M7220 user.warn kernel: CPU0: D cache: 16384 bytes, associativity 64, 32 byte lines, 8 sets
Dec 31 17:00:10 M7220 user.warn kernel: Built 1 zonelists
Dec 31 17:00:10 M7220 user.notice kernel: Kernel command line: console=/dev/null root=/dev/ram0 lpj=252928
Dec 31 17:00:10 M7220 user.warn kernel: irq: clearing pending ext status 00000200
Dec 31 17:00:10 M7220 user.warn kernel: irq: clearing subpending status 00000002 Dec 31 17:00:10 M7220 user.info kernel: wake enabled for irq 53
Dec 31 17:00:10 M7220 user.warn kernel: PID hash table entries: 256 (order: 8, 4096 bytes)
Dec 31 17:00:10 M7220 user.warn kernel: timer tcon=00000000, tcnt a509, tcfg 00000200,00000000, usec 00001e4c
Dec 31 17:00:10 M7220 user.warn kernel: Console: colour dummy device 80x30
Dec 31 17:00:10 M7220 user.warn kernel: Dentry cache hash table entries: 8192 (order: 3, 32768 bytes)
Dec 31 17:00:10 M7220 user.warn kernel: Inode-cache hash table entries: 4096 (order: 2, 16384 bytes)
Enter a web address to open, or a phrase to search for
M7220 - American Microsystems, Ltd.

4) View Live Screen

The most powerful real-time diagnostic tool available to the users is the Live Screen option. This will give the operator of the PC a true live image capture of what is currently displayed on the LCD. Clicking the refresh button on the web browser will refresh the image and update what is displayed.

**NOTE: The Live Screen web page is designed to not be cached by the web browser, but some browsers do not adhere to these guidelines. If the web page is refreshed but the same image is shown even when it is confirmed to be different on the hand-held, the web browsers cache should be cleared and the PC operator should re-login into the M7220's web site. This can also happen if the M7220 is powered off and back on in between refreshing the live image.*



Chapter 4

M7220 Configuration Utility

Overview and System Requirements

The M7220 product CD contains the M7220 hand-held computer support software including the M7220 Configuration Utility. This software package gives the operator access to all of the standard M7220 settings and allows for an easy configuration of the device's options. The user should refer to Chapter 2 of this manual for information regarding specific menu parameters on the hand-held.

System Requirements
- PC with 400MHz or higher processor clock speed, 800 MHz or higher recommended
- 256 MB of RAM or higher, 512 MB or higher recommended
- Microsoft Windows 98, 2000, XP, or Vista
- Microsoft .NET Framework version 2.0 or higher
- 3 MB of free hard disk space
- A free USB or RS-232 serial port

Obtaining and Installing the Software

The M7220 Configuration Utility can be obtained either from the American Microsystems, Ltd. website (www.amltd.com) or directly from the product CD included in the unit's box.

To start the installation, setup.exe should be executed by double clicking the icon or from the command line. The installation wizard will guide the user through the installation process.

Quick Comparison Index

Utility Tab	Tab Group	M7220 Menu
System	Security Options	[F4] – Administration, 4 – Security
System	Web Browser Options	[F4] – Administration, 7 – Terminal, 6 – Browser
System	Custom Connect Commands	[F4] – Administration, 7 – Terminal, 7 – Custom and 8 – Custom
System	Audio Feedback	[F4] – Administration, 8 – Audio
System	Power Options	[F4] – Administration, 5 – Power
Ports	M7220 Port Configuration	[F4] – Administration, 3 – Ports
Startup	Background Services	[F4] – Administration, 9 – Startup
Keyboard	Custom Function Keys	[F4] – Administration, 6 – Keyboard
Terminals	VT100/102/220 Options	[F4] – Administration, 7 – Terminal, 4 – VTxxx
Terminals	Auto-Reconnect Options	[F4] – Administration, ????
Terminals	TN5250 Options	[F4] – Administration, 7 – Terminal, 5 – TN52050
Wireless	Network Interface	[F4] – Administration, 2 – Network,1 – Interface
Wireless	Wifi Setup	[F4] – Administration, 2 – Network, 2 – Wifi
Wireless	Wifi Security	[F4] – Administration, 2 – Network, 3 – Security
Hosts	Host 1-8 Setup	[F4] – Administration, 7 – Network,1 – Hosts
Scanner	Scanner Setup	[F4] – Administration, 1 – Scanner

Using the Utility

When first executed, the M7220 Configuration Utility will display the Welcome tab with three configuration paths:

-Retrieve current settings from your M7220
-Load settings from a file on your PC
-Start from default settings

Using the Utility - cont'd.

Retrieving Settings From an M7220

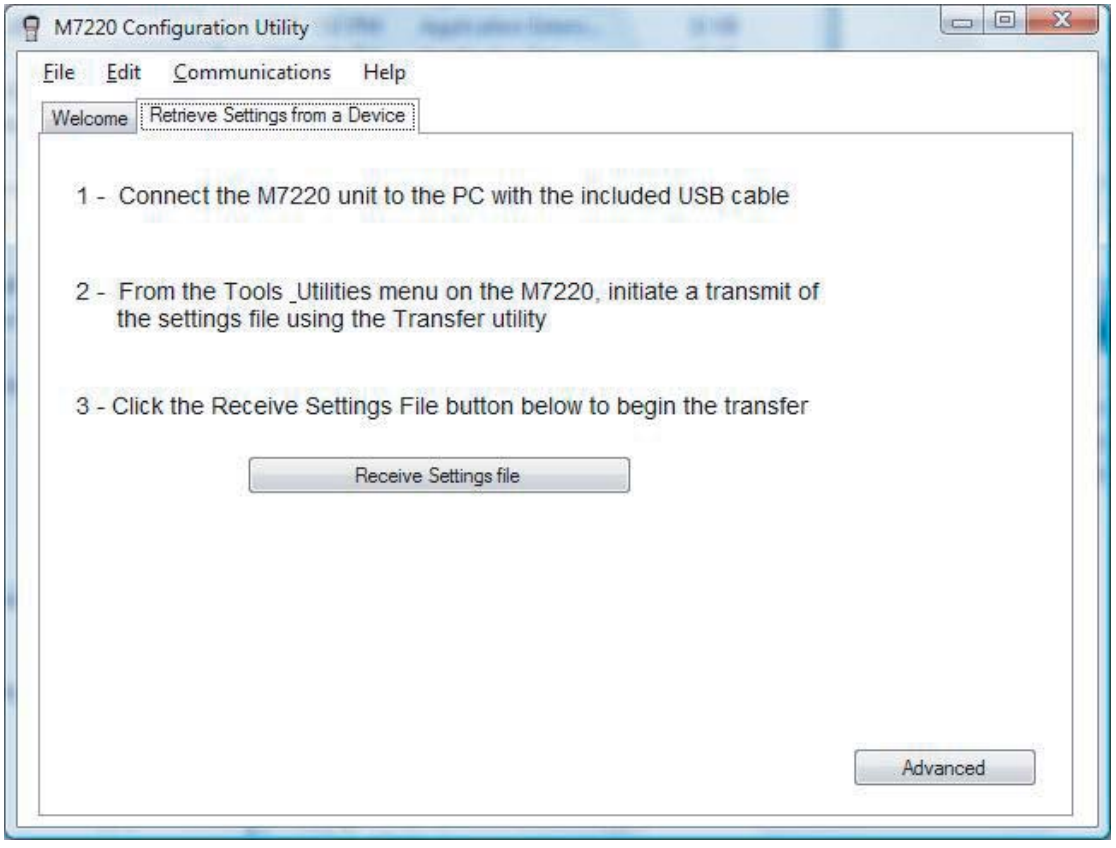
Selecting the Retrieve path from the Welcome screen allows the operator to transfer the current device settings on an M7220 hand-held computer to the PC. This allows for "cloning" devices or to simply modify parameters and settings without using the M7220 menu system. At any time during configuration, the operator can access the retrieve tab from the Communications drop-down menu at the top of the window.

**NOTE: When cloning devices, the administrator should take care to change the IP address in the configuration when using static addressing. Network communication problems can result from having more than one device using the same IP address.*

The user should follow the steps on the screen to transfer the files from the M7220 to the PC. The Advanced button allows for configuration of the serial port if USB is not available. The preferred method of communication with the M7220 is through a USB root device (i.e. directly into the PC, not through a USB hub).

The first time an M7220 unit is connected to the PC, the Windows Hardware Wizard will be displayed. When prompted, the user should point the Wizard to the M7220 product CD for the hardware drivers.

**NOTE: If an RS-232 serial port is being used for communication, the operator must make sure that both the M7220 and PC port settings match EXACTLY. The ports can be configured from the Communication drop down menu by selecting Configure PC Ports.*


M7220 Configuration Utility
File
Edit
Communications
Help
Welcome
Retrieve Settings from a Device
1 - Connect the M7220 unit to the PC with the included USB cable
2 - From the Tools _Utilities menu on the M7220, initiate a transmit of the settings file using the Transfer utility
3 - Click the Receive Settings File button below to begin the transfer
Receive Settings file
Advanced

Using the Utility - cont'd.

Sending Settings to an M7220

The currently loaded settings parameters can be sent to an M7220 hand-held computer by selecting Send from the Communications drop-down menu. The transfer will start instantly. The M7220 unit should be connected to the PC and in receive mode in the Transfer utility before initiating the transfer.

The first time an M7220 unit is connected to the PC, the Windows Hardware Wizard will be displayed. When prompted, the user should point the Wizard to the M7220 product CD for the hardware drivers.

**NOTE: If an RS-232 serial port is being used for communication, the operator must make sure that both the M7220 and PC port settings match EXACTLY. The ports can be configured from the Communication drop down menu by selecting Configure PC Ports.*

Sending Other Files to an M7220

Any file can be sent to an M7220 unit using the utility by selecting Open from the File drop-down menu. If the file selected is neither a .settings nor .txt file, the utility will automatically start the file transfer. The M7220 unit should be connected to the PC and in receive mode in the Transfer utility before initiating the transfer.

Any file sent to the device should be in the M7220's required format. The file should be a standard ZIP file containing the documents the user wishes to transfer, along with an 'autorun.sh' text file. Once received, the M7220 will decompress the ZIP file and attempt to execute the 'autorun.sh' document as a Linux shell script.

Updating the M7220 Operating System Firmware

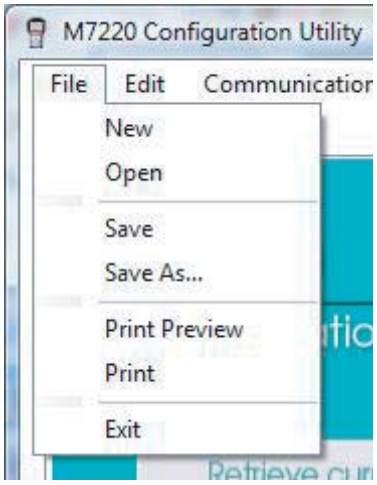
The M7220 Configuration Utility can also be used to update the hand-held's firmware, however the preferred method of updating the firmware is through the unit's embedded website. Firmware images can be downloaded from the American Microsystems, Ltd. Website at www.amltd.com.

**NOTE: This type of firmware update should be used only as a last resort. The preferred method of updating the units software is through the embedded web site. Information on the firmware update via the we site can be found in the M7220 Embedded Website section of this manual.*

To enter firmware update mode, the device should be powered off. With the operator holding down the [Menu], [Space], and [Shift] keys, the unit should be powered on. Once the M7220 splash screen is visible on the LCD, the keys should be released. The unit will power up into a fail-safe firmware update mode. The firmware can then be transferred to the device.

The M7220 Configuration Utility Menus and Tabs

The M7220 Main Menu options are as follows:



File – New
Create a new settings file using the factory defaults

File – Open
Open a previously saved settings file or a non-settings file to send

File – Save
Save the current settings

File – Save As
Save the current settings using a different file name

File – Exit
Close the program

Edit – Cut
Same as typing CTRL-X in any standard edit box.

Edit – Copy
Same as typing CTRL-C in any standard edit box.

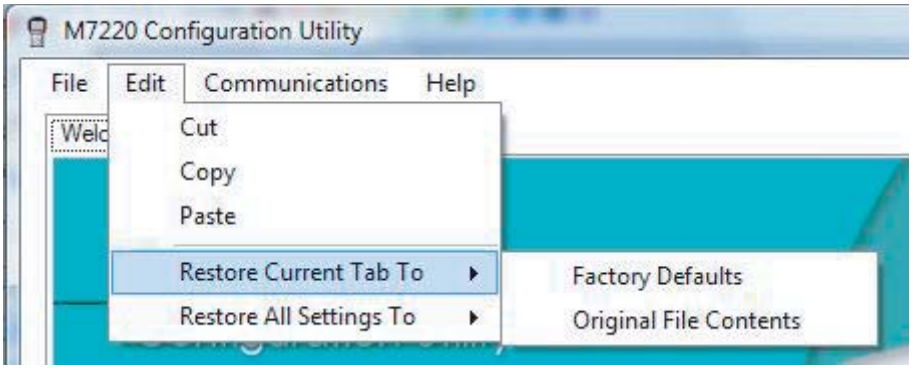
Edit – Paste
Same as typing CTRL-V in any standard edit box.

Edit – Restore Current Tab To – Factory Defaults
For each field visible on the current Tab only, reset to the values from the factory defaults.

Edit – Restore Current Tab To – Original File Contents
For each field visible on the current Tab only, reset to the values from the original file.

Edit – Restore All Settings To – Factory Defaults
For each field on all Tabs, reset to the values from the factory defaults.

Edit – Restore All Settings To – Original File Contents
For each field on all Tabs, reset to the values from the original file

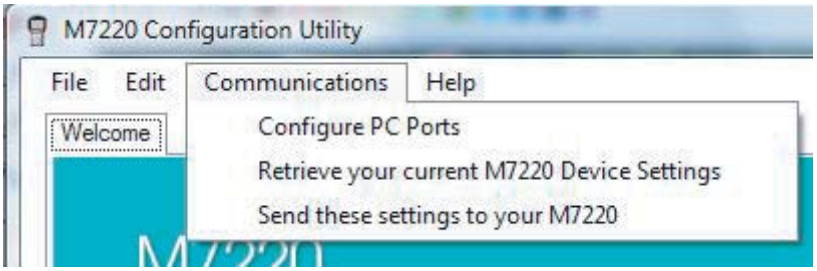


The M7220 Configuration Utility Menus and Tabs - cont'd.

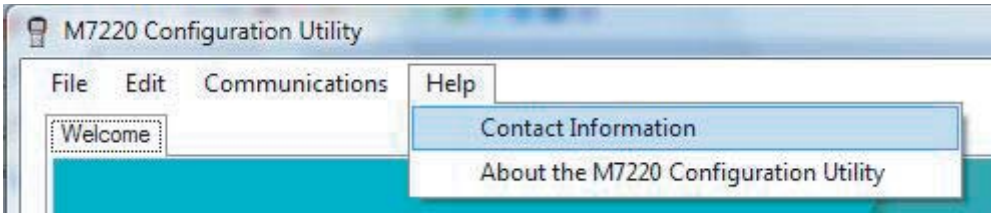
Communications – Configure PC Ports
Open the port configuration dialog.

Communications – Retrieve your current M7220 Device Settings
Receive the zipped settings file from the M7220 using ZModem.

Communications – Send these settings to your M7220
Send the zipped settings file to the M7220 using ZModem.

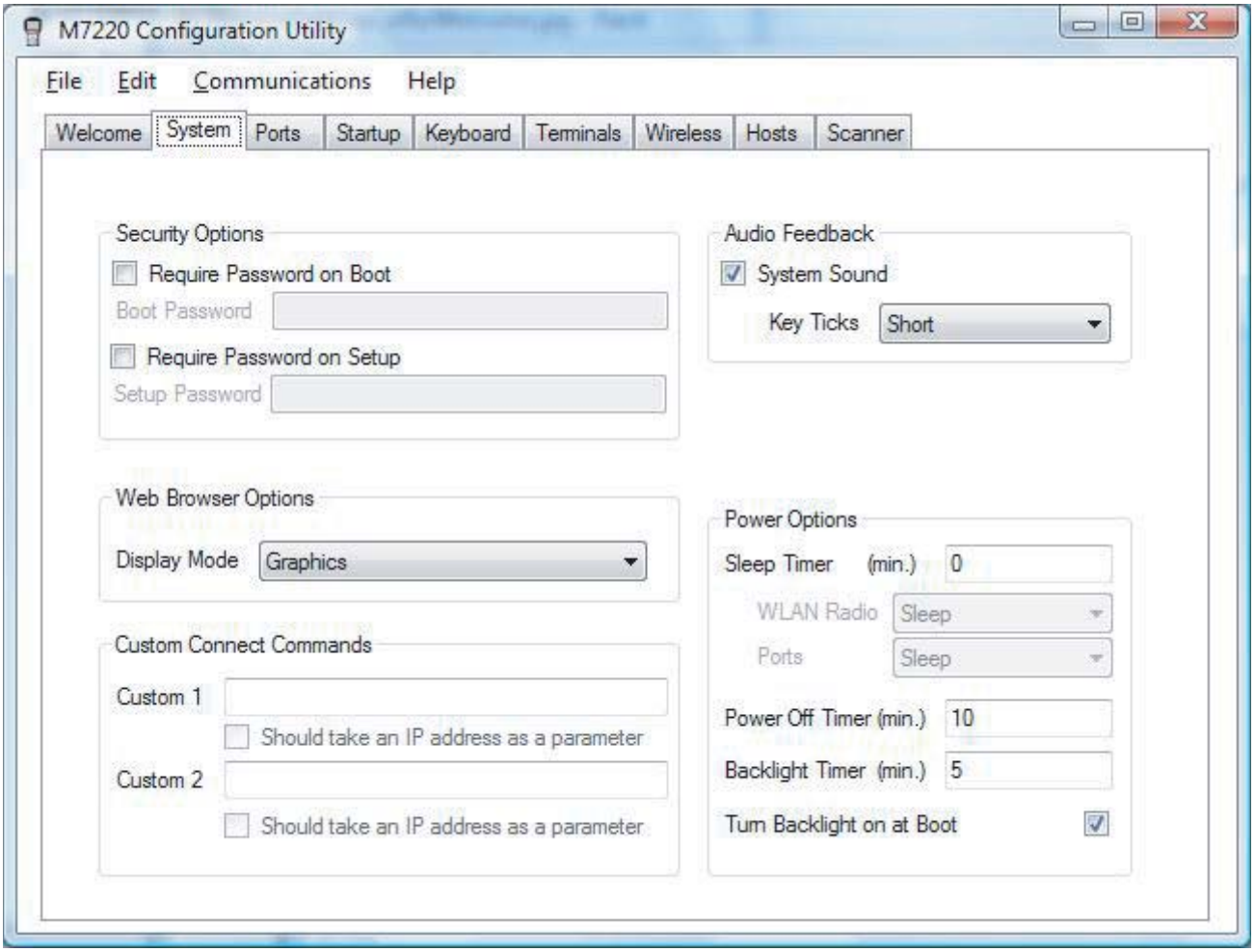


Help – Contact Information
Help – About the M7220 Configuration Utility



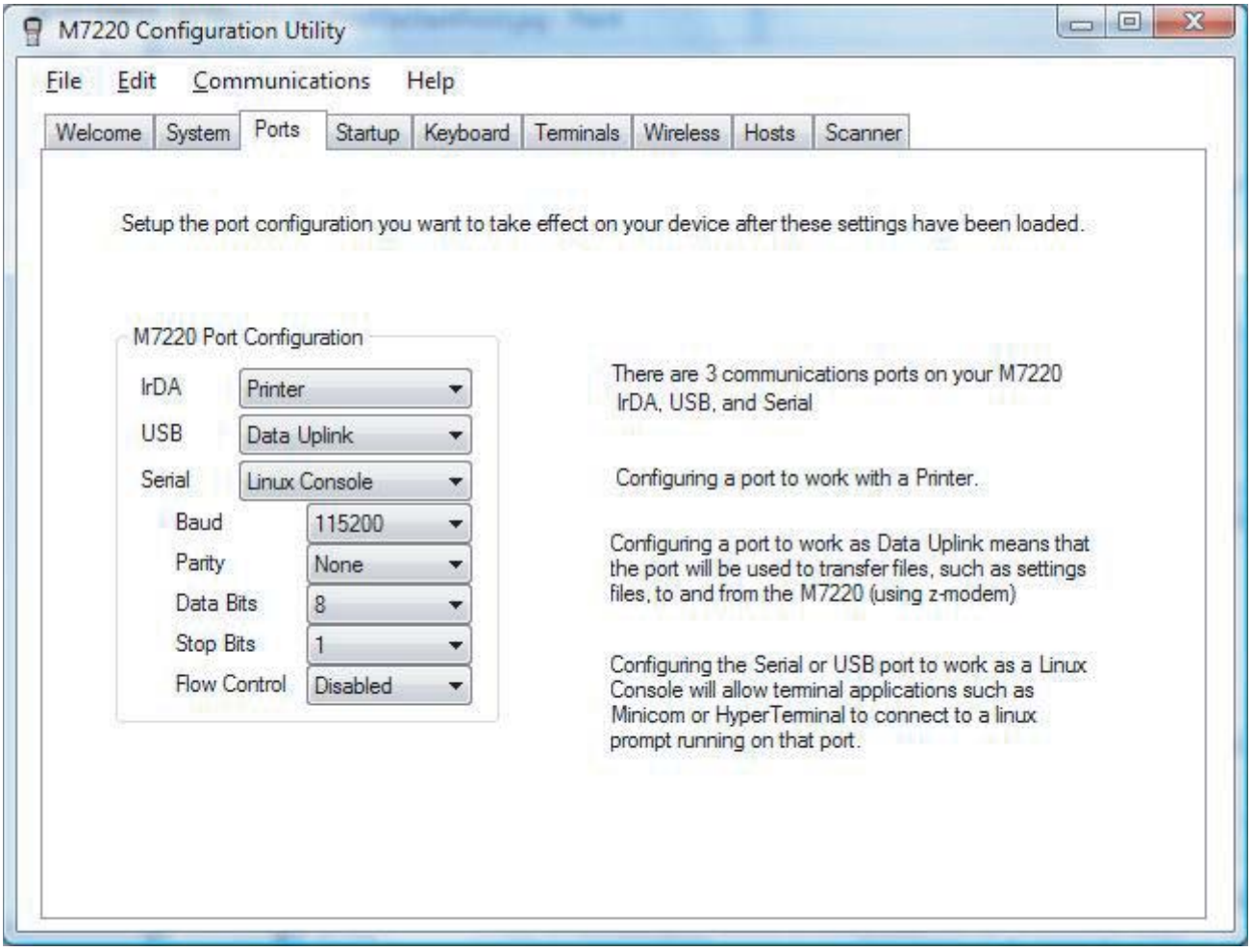
The System Tab

Setup the M7220 System's security, audio, and power settings.



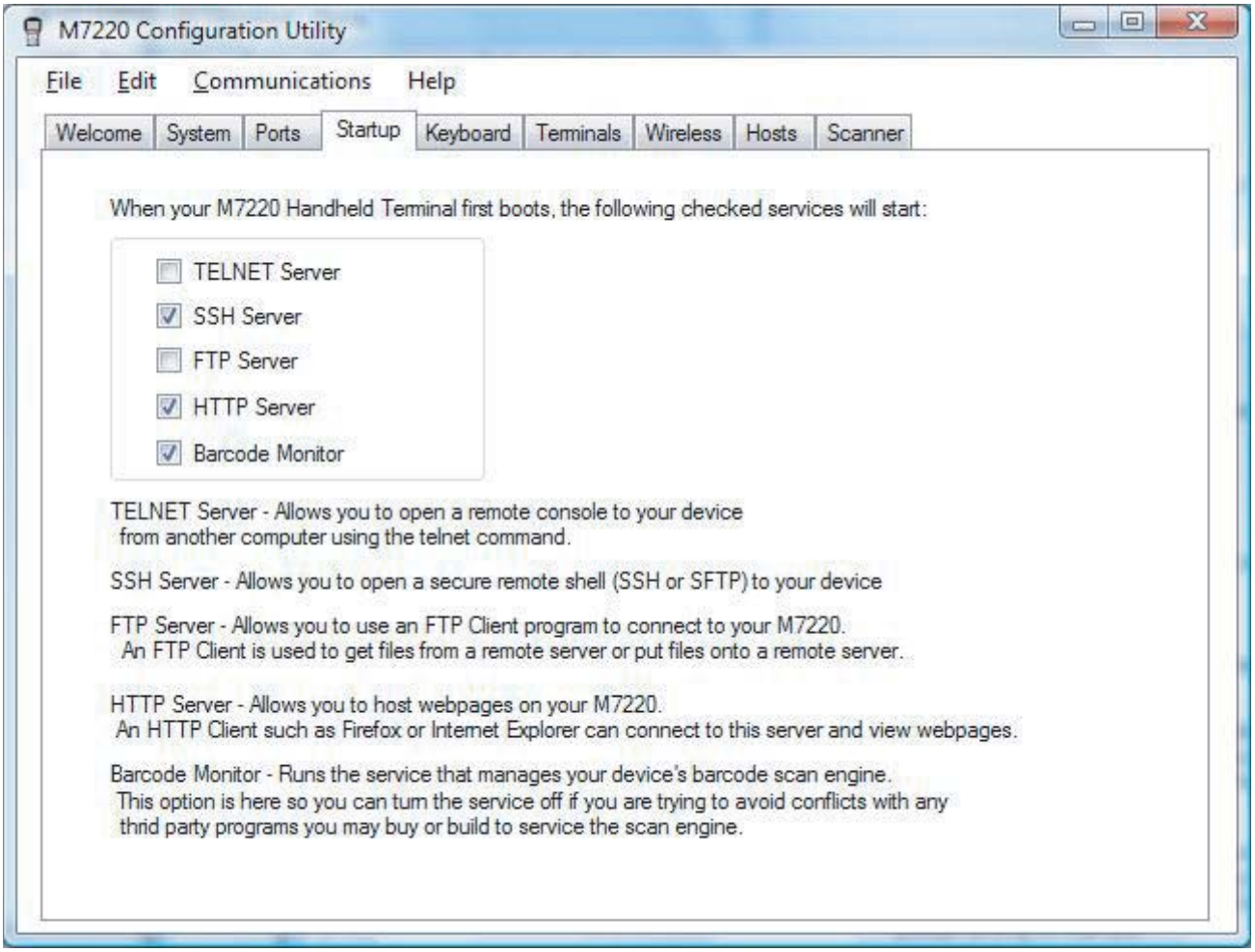
The Ports Tab

Setup your M7220 Ports for Data Uplink, Printers, or shell access.


M7220 Configuration Utility
File Edit Communications Help
Welcome System Ports Startup Keyboard Terminals Wireless Hosts Scanner
Setup the port configuration you want to take effect on your device after these settings have been loaded.
M7220 Port Configuration
IrDA Printer
USB Data Uplink
Serial Linux Console
Baud 115200
Parity None
Data Bits 8
Stop Bits 1
Flow Control Disabled
There are 3 communications ports on your M7220 IrDA, USB, and Serial
Configuring a port to work with a Printer.
Configuring a port to work as Data Uplink means that the port will be used to transfer files, such as settings files, to and from the M7220 (using z-modem)
Configuring the Serial or USB port to work as a Linux Console will allow terminal applications such as Minicom or HyperTerminal to connect to a linux prompt running on that port.

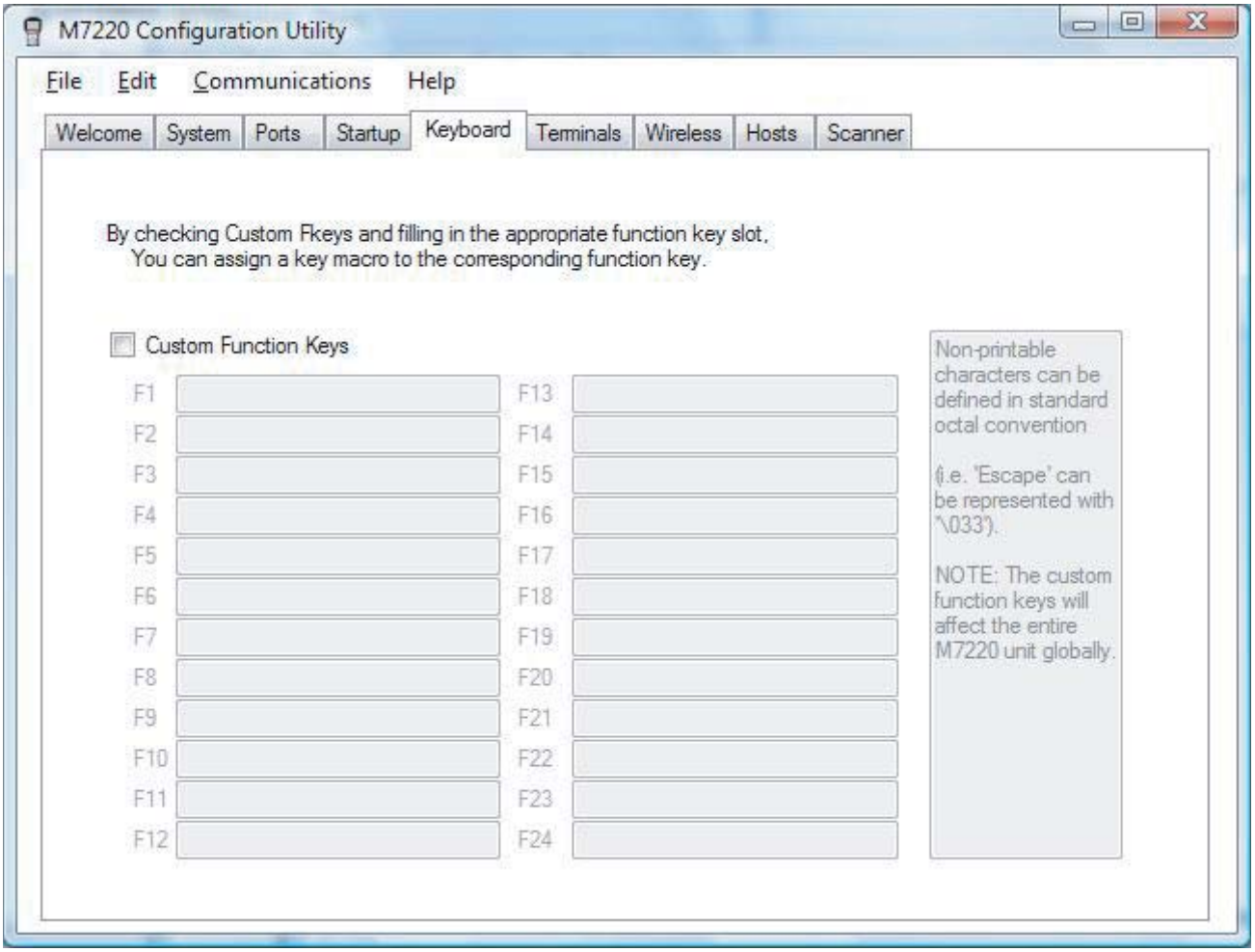
The Startup Tab

Setup the M7220 Startup services.


M7220 Configuration Utility
File Edit Communications Help
Welcome System Ports Startup Keyboard Terminals Wireless Hosts Scanner
When your M7220 Handheld Terminal first boots, the following checked services will start:
TELNET Server
SSH Server
FTP Server
HTTP Server
Barcode Monitor
TELNET Server - Allows you to open a remote console to your device from another computer using the telnet command.
SSH Server - Allows you to open a secure remote shell (SSH or SFTP) to your device
FTP Server - Allows you to use an FTP Client program to connect to your M7220. An FTP Client is used to get files from a remote server or put files onto a remote server.
HTTP Server - Allows you to host webpages on your M7220. An HTTP Client such as Firefox or Internet Explorer can connect to this server and view webpages.
Barcode Monitor - Runs the service that manages your device's barcode scan engine. This option is here so you can turn the service off if you are trying to avoid conflicts with any third party programs you may buy or build to service the scan engine.

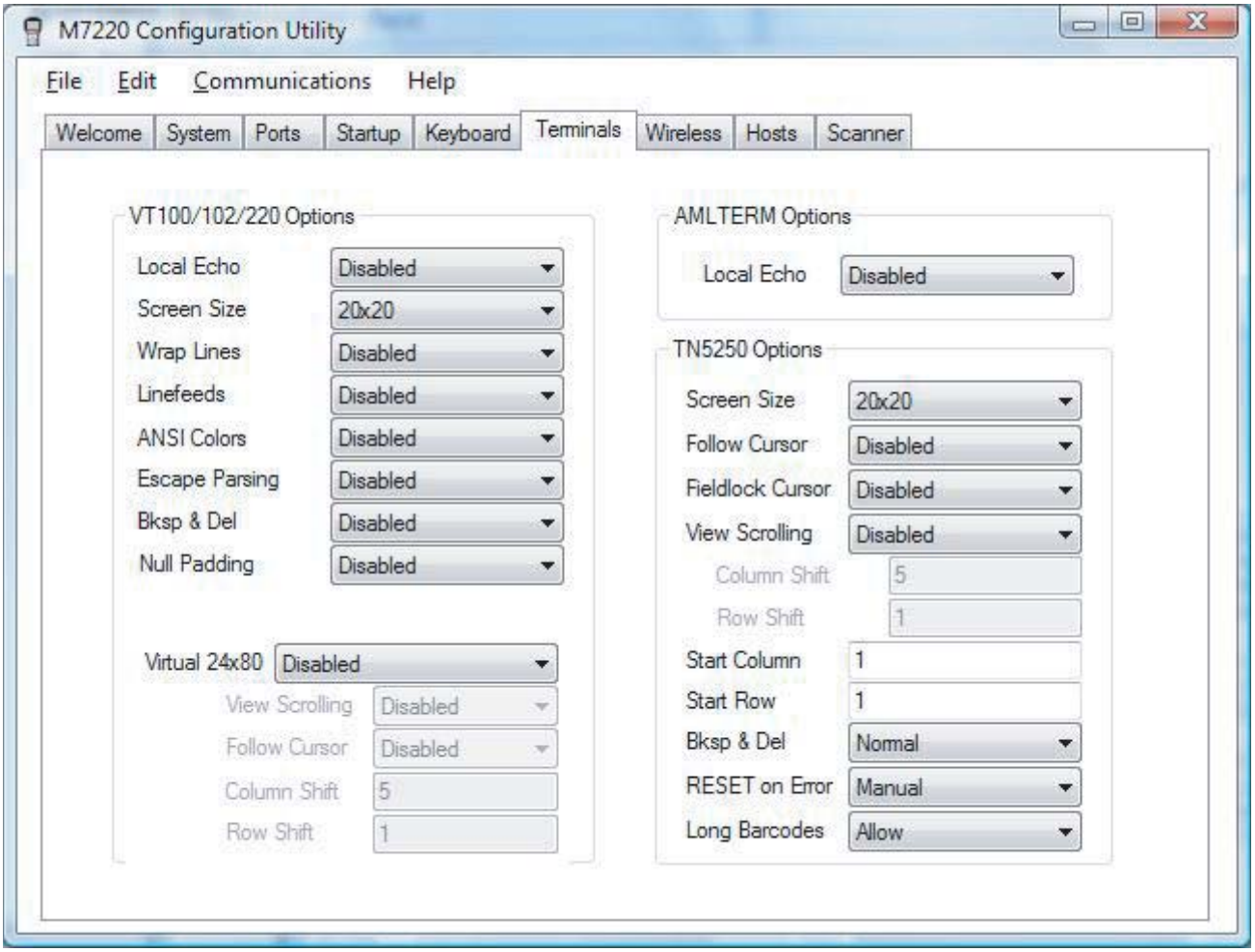
The Keyboard Tab

Customize the M7220 keyboard's function keys.


M7220 Configuration Utility
File Edit Communications Help
Welcome System Ports Startup Keyboard Terminals Wireless Hosts Scanner
By checking Custom Fkeys and filling in the appropriate function key slot,
You can assign a key macro to the corresponding function key.
Custom Function Keys
F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12
F13 F14 F15 F16 F17 F18 F19 F20 F21 F22 F23 F24
Non-printable characters can be defined in standard octal convention
(i.e. 'Escape' can be represented with '\033').
NOTE: The custom function keys will affect the entire M7220 unit globally.

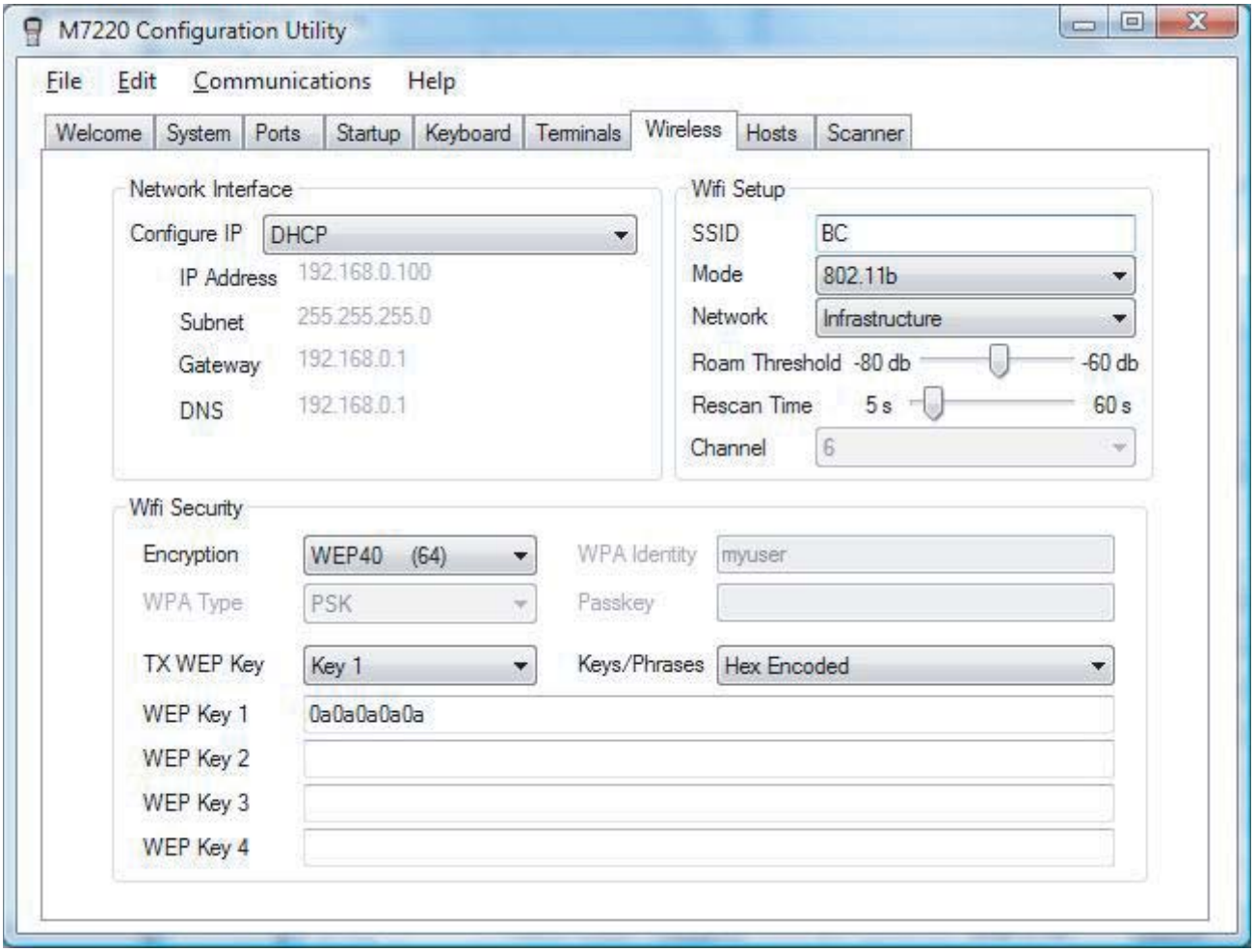
The Terminals Tab

Setup the M7220 VT and TN5250 settings.



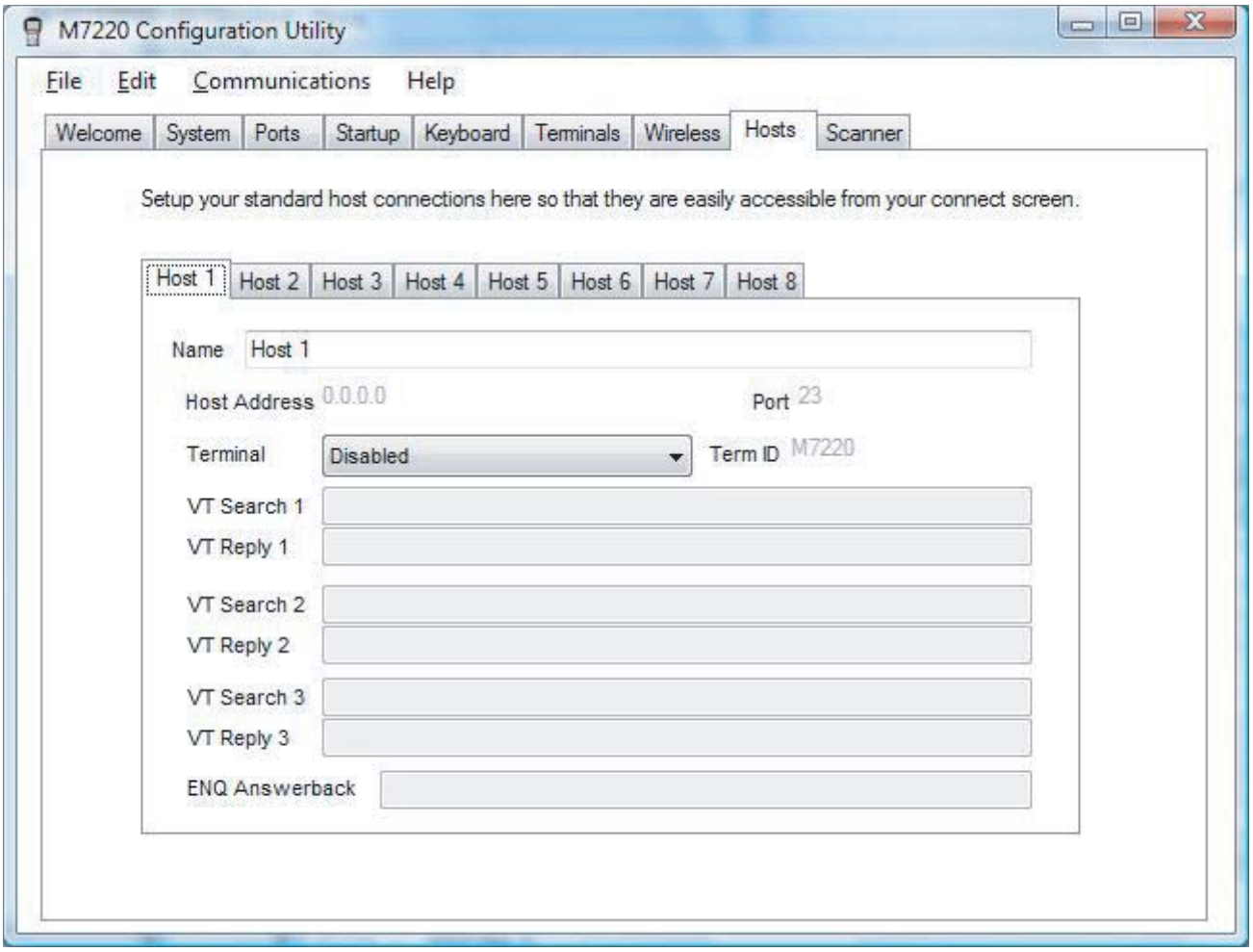
The Wireless Tab

Setup the M7220 wireless communications settings.



The Hosts Tab

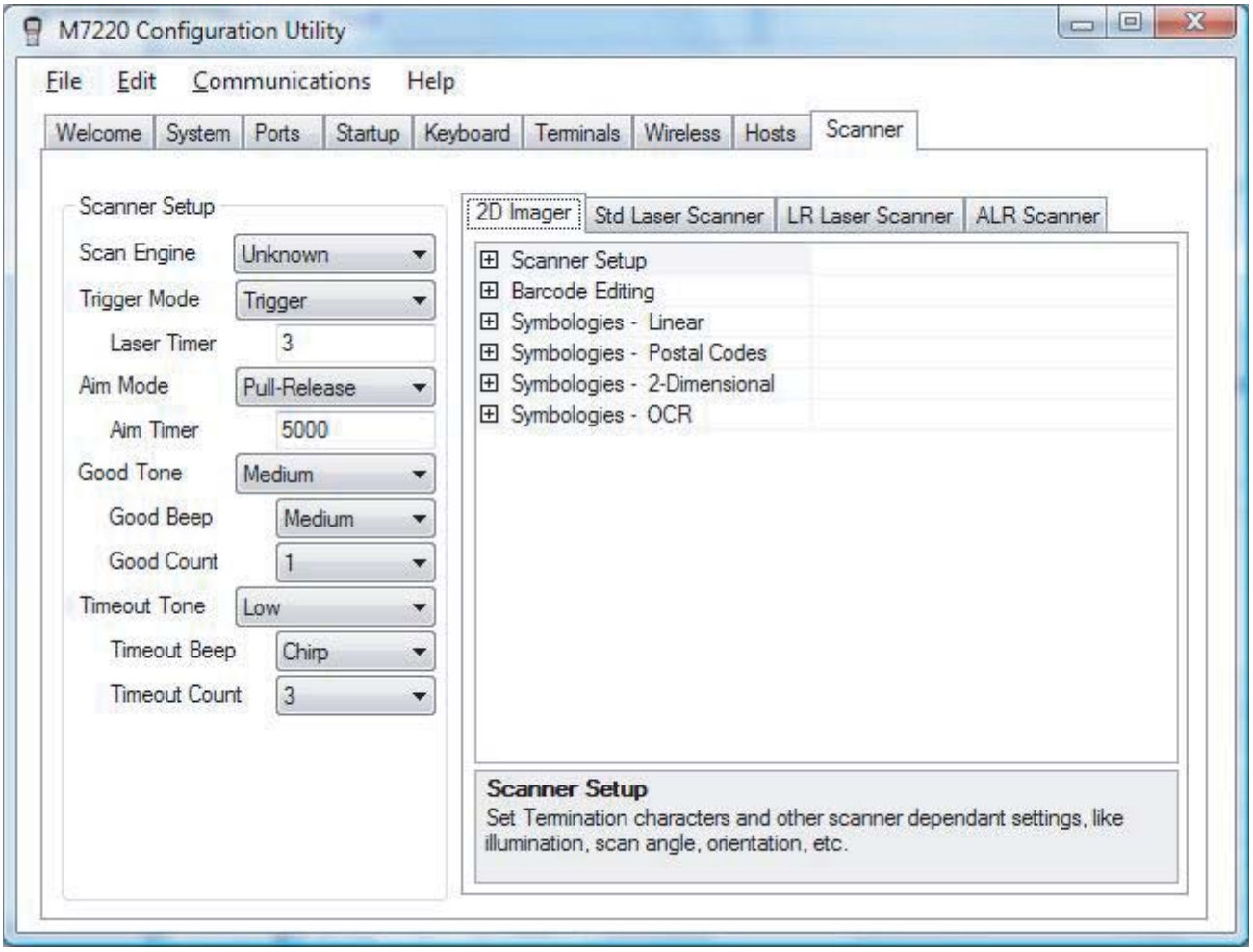
Name and predefine the host connections the M7220 will use to connect to servers on the network.


M7220 Configuration Utility
File Edit Communications Help
Welcome System Ports Startup Keyboard Terminals Wireless Hosts Scanner
Setup your standard host connections here so that they are easily accessible from your connect screen.
Host 1 Host 2 Host 3 Host 4 Host 5 Host 6 Host 7 Host 8
Name Host 1
Host Address 0.0.0.0
Port 23
Terminal Disabled
Term ID M7220
VT Search 1
VT Reply 1
VT Search 2
VT Reply 2
VT Search 3
VT Reply 3
ENQ Answerback

The Scanner Tab

The Scanner Tab allows the user to define and set the bar code scan engine settings.

**NOTE: The M7220 Configuration Utility does not store what scan engine type is installed on the M7220 units. The operator must make sure they have selected to correct scan engine type before making modifications to the settings. If the unit has a 2-Dimensional Imager installed, the Laser settings will have no effect, and vice versa.*



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